ENGINEERING NEWS-RECORD

MAY 29, 1958

PRICE 50 CENTS

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▶Water main takes subway crosstown (p. 30)

▶The smoothest pavement in the state (p. 52)

Henry Brunnier– 50 years in the Golden West (p. 64)

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LANSING MICH 13

1 Analytical weighing of specimens prior to testing

2 Steam condensate corrosion test

3 Cleaning specimens with inhibited hydrochloric acid

4 Second analytical weighing to determine corrosion weight loss

5 Calculation and statistical analysis of laboratory test results

6 Final examination of specimens under low power magnification

Extensive testing program proves new 4-D Wrought Iron more corrosion-resistant than ferrous substitutes

Test results from the Byers Research Laboratory lend documentary support to the superiority of new 4-D Wrought Iron—over standard Wrought Iron as well as ferrous substitutes.

Convincing case-history service records are now further substantiated by the conclusive findings of our metallurgical staff. Some typical results of this testing program are presented in the chart at right.

The Byers field service representative will be pleased to relate these test results to your corrosive applications. Write us for helpful literature on new 4-D Wrought Iron. A. M. Byers Company, Clark Building, Pittsburgh 22, Pennsylvania.

BYERS WROUGHT IRON

Comparative Analysis of 4-D Wrought Iron Corrosion Tests

Tests	4-D Wrought Iron	Standard Wrought Iron	Ferrous Substitutes
Severe industrial atmospheric continued exposure 17 years	Corrosion weight loss 540 grams/sq. ft.	Corrosion weight loss 655 grams/sq. ft.	Not included in test
Steam condensate return line	*At least 25% greater corrosion-resistance than standard Wrought Iron	No failures 10 years (still in service)	Complete failure after 2 years
Aerated salt water—5 weeks (Short term test—points indicate 4-D Wrought Iron curve flattening out at much lower rate of attack)	Corrosion weight loss 146 mg/sq. in.	Corrosion weight loss 170 mg/sq. in.	Corrosion wt. loss 226 mg/sq. in.
Brine piping	*At least 25% greater corrosion-resistance than standard Wrought Iron	No failures 23 years (still in service)	Complete failure after 7 years
Salt water, Gulf of Mexico ¼ inch plate—17 years	Corrosion weight loss 4 mills/years (minimum plate thickness now $\frac{3}{16}$") Still in excellent condition	Not included in test	Corrosion weight loss 30 mills/years; plate badly pitted, perforated
Downspout	*At least 25% greater corrosion-resistance than standard Wrought Iron	No failures in 29 years (Still in service)	Complete failure after 18 years

*In this application no long term test data yet available on 4-D Wrought Iron. Results shown are derived from short term tests.

GOODYEAR INDUSTRIAL PRODUCTS
GTR-Specified Style B Conveyor Belt
for long-term haulage
A
B
C
A Thick, tough, high-tensile-strength rubber cover for excellent resistance to abrasion and cutting
B Multiple plies of heavy fabric as load carriers of high capacity
C Skim coat of rubber for added flex-life

Served twice as long on rugged rock-pile job

Lifting 8-inch rock—at 350 tons an hour—up 125 feet to the crusher-mouth proved a belt-breaking job at this California quarry. Under the great weight, previous belts soon stretched beyond use. All failed in less than 4 years.

Then the G.T.M. – Goodyear Technical Man – made a recommendation: high-tensile-strength Style B Belt, constructed to resist abrasion and stretch under heavy loads. His belt lasted *twice* as long as its predecessor—with far less time out for adjustment. Its great success prompted the replacement of every other belt in the plant with Goodyear belts.

And that's only one of many problems where the G.T.M.'s solution has been a big time- and money-saver. To tap this knowledge and experience for *your* business, contact him through your Goodyear Distributor or write:

Goodyear, Industrial Products Division,
Akron 16, Ohio

CONVEYOR BELTS by

GOODYEAR

THE GREATEST NAME IN RUBBER

IT'S SMART TO DO BUSINESS *with your Goodyear Distributor. He can give you fast, dependable service on Hose, V-Belts, Flat Belts and many other industrial rubber and nonrubber supplies. Look for him in the Yellow Pages under "Rubber Goods" or "Rubber Products."*

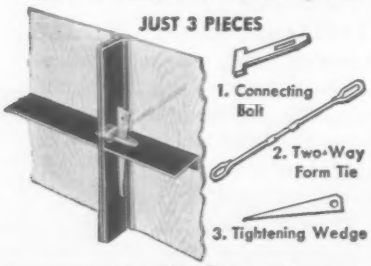
Commercial Forming

Symons Forms Help Contractor Speed Work on Bank Job

Used to Pour Foundation, Vaults & Retaining Walls

Designer and builder, Western Bank Contractors, Inc., Kansas City, Mo., used concrete to provide new look for banking in Kansas City. 4,000 square feet of Symons Steel-Ply Forms were used to speed construction of the foundation, vaults & retaining walls on this new $250,000 Community State Bank of Kansas City, Mo.

Initial cost of Symons Steel-Ply Forms is higher than Wood-Ply Forms, but this is more than offset by the



many reuses possible. Low-cost-per-use plus easier handling and stacking are reasons for the increasing demand.

Symons Steel-Ply Forms can be rented with purchase option. Steel-Ply Form Catalog FREE upon request.

Symons

SYMONS CLAMP & MFG. CO.

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Chicago 39, Illinois

ENGINEERING NEWS-RECORD

EIGHTY-FOURTH YEAR OF PUBLICATION

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ENGINEERING NEWS-RECORD, Vol. 160, No. 22, May 29, 1958

Published weekly by McGraw-Hill Publishing Company, James H. McGraw (1860-1948), Founder. Publication Office, 99-129 North Broadway, Albany 1, N. Y. See panel below for directions regarding subscriptions or change in address. **Executive, Editorial, Advertising and Circulation Offices. McGraw-Hill Building, 330 W. 42nd St., New York 36, N. Y.** Donald C. McGraw, President; Joseph A. Gerardi, Executive Vice President; L. Keith Goodrich, Vice President and Treasurer; John J. Cooke, Secretary; Nelson Bond, Executive Vice President, Publications Division; Ralph B. Smith, Vice President and Editorial Director; Joseph H. Allen, Vice President and Director of Advertising Sales; A. R. Venezian, Vice President and Circulation Coordinator. **Subscriptions are solicited only from persons with identifiable commercial or professional interests in construction and building. Position and company connection must be indicated on subscription orders.** United States subscription rate for individuals in the field of this publication $6.00 per year, single copies 50 cents; foreign $20.00 per year, payable in advance. Second-Class mail privileges authorized at Albany, New York. Printed in U.S.A. Title registered in U.S. Patent Office.

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SUBSCRIPTIONS: Send subscription correspondence and change of address to Subscription Manager, ENGINEERING NEWS-RECORD, 330 W. 42nd St., New York 36, N. Y. Subscribers should notify publisher promptly of any change of address, giving old as well as new address, and including postal zone number, if any. If possible, enclose an address label from a recent issue of the magazine. Please allow one month for change to become effective.

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NINE NORTHWESTS

for L. B. STRANDBERG & SON CO. INC., CHICAGO, ILL.

L. B. STRANDBERG of Chicago has the contract on one of the most difficult structures on the Illinois Toll Roads. This is the tri-level overpass at Des Plaines, Ill., where the Northwest Expressway and the Tri-State Toll Road cross.

This is only one of the many overpasses that the Strandberg organization is handling. L. B. Strandberg & Son Co., Inc., has many years of background on the problem of structures. This experience has told them a lot about cranes. It is significant that they have added their ninth Northwest to their fleet.

Northwest Cranes bring you every advantage for smooth handling, smooth booming and high job production. There is a wide range of boom hoist equipment. You can have booming independent of all other operations with power both up and down. The third drum gives you three load lines. Uniform Pressure Swing Clutches eliminate the grabs and jerks that make spotting the load both unsafe and difficult. The Feather-Touch Clutch Control assures ease of operation without resorting to pumps, compressors and other delicate mechanisms; but more than that, it retains the true *feel of the load* which gives the operator greater accuracy at the "hook".

Mast type gantries and folding gantries under power, solve the clearance problems. Removable counterweight, telescopic boom struts, pins, extended boom point sheave shafts, sectional boom hoist rigging, are all available to suit your needs. Ask for full details and, remember, that there is no better testimonial to performance than a repeat order.

NORTHWEST ENGINEERING COMPANY
1502 Field Building, 135 South LaSalle Street,
Chicago 3, Illinois

NORTHWEST Always Ready to GO

NORTHWEST EQUIPMENT IS BUILT IN THE FOLLOWING SIZES

SHOVELS	CRANES	DRAGLINES	PULLSHOVELS	TRUCK CRANES
¾ Yd. to 2½ Yd. Capacity	13-Ton to 50-Ton Capacity	¾ Yd. to 3 Yd. Capacity	¾ Yd. to 2½ Yd. Capacity	25-Ton and 35-Ton Capacity

Robert Groff, owner of Northridge Equipment Rentals, California, takes delivery of his 18th Le Roi Compressor, model 85.

"Here's How I Make Money on Compressor Rentals"

LeRoi Compressors give top performance, require little maintenance, bring maximum profits from satisfied customers.

New units rented out minutes after delivery.

"If I have to make two service calls a month on a rental compressor, I lose the profit on that month's use," says Robert Groff, owner of Northridge Equipment Rentals, Northridge, California.

"That's why I always choose Le Roi and now own eighteen," says Groff. "They run day after day with little care, attention, or upkeep."

Dependability and performance are the cornerstones of Groff's successful business. His customers expect trouble-free equipment, economical in operation, and Groff sees that they get it! No company, he says, can hope to succeed in a rental business if they put their money into inferior equipment.

So much in demand are Le Roi Compressors that the eighteenth unit, shown above, was rented out minutes after delivery.

The Le Roi Air Compressor units rented out by Groff have a capacity of 85 cfm. They're ideal where portability is important . . . they trail well behind vehicles, and are balanced so that one man can easily position them on the job-site.

They're easy to operate, too. One control — the starter button — gives you 85 feet of air at 100 pounds pressure. That's more than ample for powering a heavy breaker. They are a perfect power source for Le Roi Newmatic Air Tools.

There's a big, lockable tool box on each unit — weathertight, and large enough to hold air tools, hose, and accessories.

Other Le Roi Compressors range in capacity from 105 to 600 cfm. All of them feature Le Roi's integral packages — proved air sources with power matched to the compressor by a manufacturer who knows both engines *and* air.

The qualities that make Le Roi air compressors money-makers in rental service are the same qualities that make them the favorite of owners, everywhere.

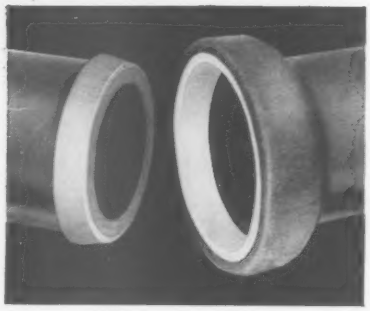
Whether you rent or buy, Le Roi's can be counted on for dependable, trouble-free operation.

PC-71

LE ROI Division of Westinghouse Air Brake Co., Milwaukee 1, Wisconsin, manufacturers of Cleveland air tools, Tractair, portable and stationary air compressors, and heavy-duty industrial engines. Write us for information on any of these products.

Protect your community's health SIX WAYS with longer, stronger AMVIT Clay Pipe

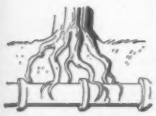
Outstanding Mechanical Joint on pipe over 4 feet long One of your City's Lifelines



Each year thousands of taxpayer's dollars are *wasted* on "substitute" materials used in sewer lines. Failure and collapse of non-clay sewers endangers the health of the community. Sewers must be constructed of permanent materials for they carry to safe disposal thousands of tons of waste laden with dangerous and deadly bacteria.

Amvit Jointed Clay Pipe gives decades of uninterrupted underground service. Neither joint nor pipe is affected by these factors:

1. ROOTS

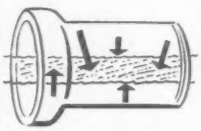


force the pipe out of line and clog the system in search of moisture. Amvit is a compression joint on the ball and socket principle. The surfaces of both bell and spigot are in constant compression. Roots cannot enter the line.

2. CHEMICAL ATTACK

is from acid-laden, high temperature sewage, discharged from dishwashers, garbage disposal units and washing machines. Like the clay pipe, Amvit Joint is acid resistant and will not corrode or decompose.

3. FLOW LINE ATTACK



refers to that section of the pipe which lies between low and high water. Grease and scum tend to build up here and acts as a solvent on certain synthetic substitute pipes. The design of the Amvit Joint assures that the pipe is self centered at all times. This gives perfect alignment and self-cleansing.

4. EROSION

is the wearing out of pipe by abrasive action of sand and gravel. Soft pipes become scratched and roughened and tend to clog up. Because Amvit is a really tight joint, no foreign matter can possibly enter the line.

5. DECOMPOSITION

is the chemical breakdown of the component elements of the pipe. Only clay pipe resists decomposition. Like the pipe, the joint is unaffected by ordinary conditions of underground service.

6. RODENTS AND TERMITES

will gnaw away wrappings and coatings of pipe. Amvit Clay Pipe defies even the sharpest toothed rodent and is immune to termite attack.

*T. M. Registered.

For more information on how Amvit can help cut your sewer project costs, write or call American Vitrified Products Company, National City Bank Building, Cleveland, Ohio, or our office nearest you.

SINCE 1900

AMERICAN

American Vitrified Products Company

CLEVELAND, OHIO

MANUFACTURERS OF: Clay Pipe, Flue Liners, Clay Liner Plates and Concrete Pipe.

Plants Across the Nation . . . Brazil, Indiana · Chicago, Illinois · Cleveland, Ohio · Crawfordsville, Indiana · Detroit, Michigan · East Liverpool, Ohio Fenton, Michigan · Grand Ledge, Michigan · Lisbon, Ohio · Los Angeles, California · Milwaukee, Wisconsin · South Bend, Indiana · Uhrichsville, Ohio

PICTURE OF A BARGAIN BEING DRIVEN

When you specify Raymond foundations, one of the important bargains you are paying for is *single responsibility*. From the soil investigation through the actual pile manufacturing, load testing and finally the installation, Raymond, unlike any other foundation organization in the country, offers—and is responsible for—a complete foundation service.

No matter how large or small the job, all of the details are handled expertly, efficiently by the company with over 300,000,000 man-hours of experience. Wherever you are located in the United States, there's a Raymond office nearby ready to assist you. Outside the United States, we are specialists in all types of general construction. May we help? We're as near as your telephone . . . or write our main offices, 140 Cedar Street, New York 6, N. Y.

RAYMOND
CONCRETE PILE COMPANY
A DIVISION OF RAYMOND INTERNATIONAL INC.

Send for our new Highway Brochure which gives a detailed resume of how Raymond can help you and the National Highway program. Dept. E-9, Raymond Concrete Pile Co., 140 Cedar St., N. Y. 6, N. Y.

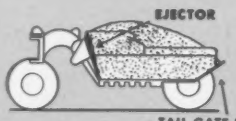
FROM ST. LAWRENCE SEAWAY TO CALIFORNIA

YUBA

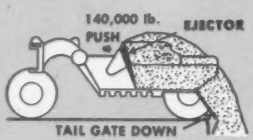
Movall

Dumping glue-like clay on St. Lawrence Seaway. "Better than any other hauling unit for this type of work" says contractor.

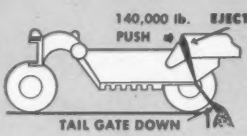
Accurately spreading surfacing material in fifth gear at Mather Air Base, California. No tractor or motor grader was used.



LOADED — The big target, big capacity body carries its load low, maintaining high ground clearance since frame and body are integral and compact.



DUMPING — Level body offers no gravity resistance, with potential 140,000 lb. ejector push assuring complete positive discharge with minimum use of power.



EMPTY — Sides and bottom are scraped clean, eliminating need for "mucking out" or decreasing capacity for next full load. Complete ejection takes only 11 to 14 seconds.

This rugged multi-purpose high speed hauler outperforms rear-dumps and bottom-dumps on most every type of off-highway job

Earthmoving that only a MOVALL can do at such high profit

Exclusive level action positive ejector spreads surfacing material on the fly, completely unloads sticky clay or any top loading material. Full stability during all operations, high clearance, short turning radius, big capacity, and less downtime mean *more profits* on *more types of jobs.* See your Allis-Chalmers, Caterpillar, or International Harvester Dealer – or phone or write Yuba direct. *Now is the time.*

MA-803

YUBA MANUFACTURING DIVISION

YUBA

704 EAST H STREET • BENICIA, CALIFORNIA

YUBA CONSOLIDATED INDUSTRIES, INC.

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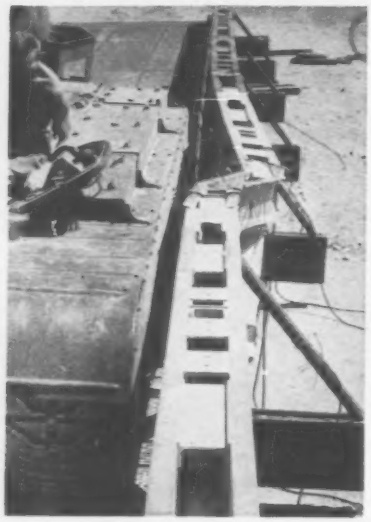

Top-chord Buckling

SIR—The report of a pipeline-bridge collapse (ENR Feb. 20, p. 24) brought back memories of a 1948 experience that I believe to be a similar type of failure. During ultimate-capacity load tests on a 150 ft span, prefabricated aluminum bridge, a top chord failed. This happened at the center of the span on the second pass of a heavily loaded 50 ton tank over the bridge.

The bridge being tested had top chords with battens but no cover plates. After this load test, cover plates were added for the full 15 ft length of each panel and the buckling deficiency was corrected.

F. J. TAMANINI
Engineer Research and Development Laboratories, Ft. Belvoir, Va.

Computer Service Firms

Sir—Your article, "Tips on Organizing Computer Operation" (ENR Mar. 27, p. 43) states that about 100 civil engineering agencies now have their own electronic computers. As far as the writer is aware, all of these computers are either small or medium size ones. There are in operation today in the U. S. approximately 250 large size electronic digital computers in the price range of $1 million or more, or rentals of an average of $30,000 per month for one shift operation. These machines are in the possession of very large companies and government installations.

In general, the increased speed, capacity and flexibility more than justify the increased cost of a large computer as compared to a medium or small size computer, provided an organization has enough problems to keep the computer busy. These giants consume large volumes of problems at a fantastically rapid rate. For example, it is the writer's contention that one IBM 704 computer could perform the earthwork computations for all 48 states.

A large computer is capable of handling problems that would not be feasible with a medium size computer. For example, a program for earthwork computations has been set up for an IBM 704 computer that will determine the grades for optimizing any set of given conditions and yet retain all of the necessary restrictions.

It is very fine for any user to acquire a computer, provided this equipment can be justified. However, for each user that is able to justify its own machine, there are many who just do not have the volume. These agencies should certainly make use of the advantages of computers by either using a service bureau, with or without their own programming, or engaging the services of a company specializing in computers.

It is the writer's opinion that some civil engineering agencies that have their own machines, may have found it more efficient and productive to have used computer service groups. Even those offices with a medium size computer will occasionally have problems that should be run on a large computer.

There are some computer salesmen today who would have us believe that the computer they are selling is the cure-all for all evils. Certainly, computers are a great boon, permitting the solution of problems that formerly were not feasible. However, computers themselves do create new headaches. Anyone planning their use must realize this.

H. SCHUTZBERGER
Morris Engineering Albuquerque, N. M.

CALENDAR

Western Association of State Highway Officials, 37th annual meeting, Hotel Utah, Salt Lake City, Utah, June 3-6.

American Institute of Architects, annual convention, Hotel Cleveland, Cleveland, Ohio, June 7-11.

National Society of Professional Engineers, annual meeting, Chase-Park Plaza Hotel, St. Louis, Mo., June 11-14.

American Society for Testing Materials, 61st annual meeting, Hotel Statler and Sheraton Plaza Hotel, Boston, Mass., June 22-27.

American Society of Heating and Air Conditioning Engineers, semi-annual meeting, Pick-Nicollet Hotel, Minneapolis, Minn., June 23-25.

American Society of Civil Engineers, Multnomah Hotel, Portland, Ore., June 23-27.

See a participating
BLUE BRUTE DISTRIBUTOR
for more details about the Guaranteed Availability Plan

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ARIZONA
Junction Bit & Tool Co.
Phoenix

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Humboldt Machine Works, Arcata
Essick Machinery Co., Los Angeles
L. E. McDowell Co., Richmond
Western Traction Co., San Francisco

COLORADO
Power Rental Equipment, Inc.
Denver

CONNECTICUT
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FLORIDA
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Highway Equipment & Supply Co.
Orlando

GEORGIA
Tractor & Machinery Co., Inc.
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ILLINOIS
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Hutchinson

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Big Three Welding Supply
Fort Worth, Dallas, El Paso, Odessa, Longview, Lubbock, Borger, Farmington, Albuquerque (N. M.)

WEST VIRGINIA
Construction Equipment Inc., Charleston

WYOMING
Keremi Tractor and Equipment Co., Cheyenne

Give your Blue Brute a breather...

BORROW AN AIR TOOL FREE FROM YOUR DISTRIBUTOR UNDER THE GUARANTEED AVAILABILITY PLAN

Worthington Blue Brute tools are gluttons for punishment. Check. But even a Blue Brute needs an occasional check-up. That's when you'll appreciate the new Guaranteed Availability Plan of your Blue Brute distributors listed at the left.

Here's how G.A.P. works: 1) you bring in your hand-held Blue Brute tool for repairs. While it's in the distributor's shop, 2) he lends you an air tool to keep the job going. He's got a complete line of Blue Brute tools to choose from. He also carries a large inventory of "Blu-Coated" parts so that repairs or replacements are made quickly and inexpensively.

It adds up to this: buy Blue Brute tools and "no time is down-time." See your nearest Blue Brute distributor for the complete details about the Guaranteed Availability Plan. 60-1

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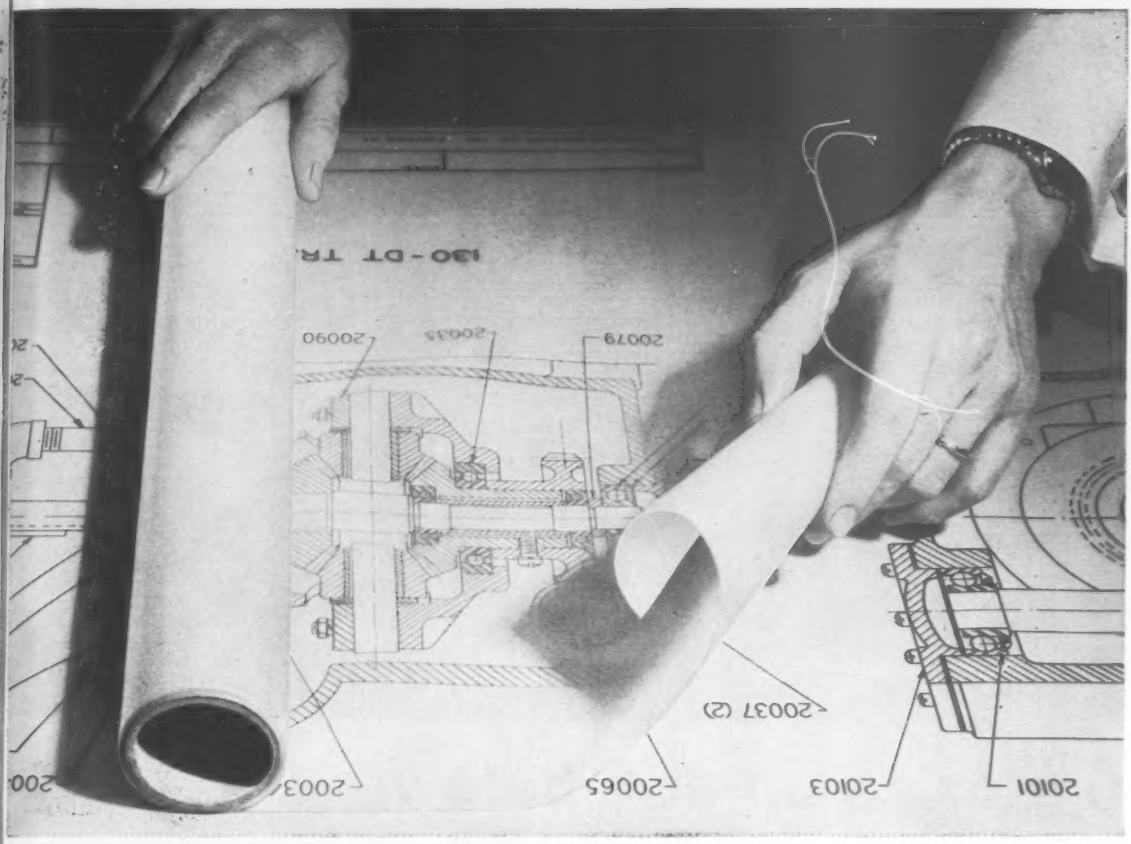

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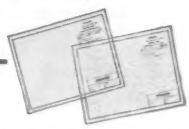

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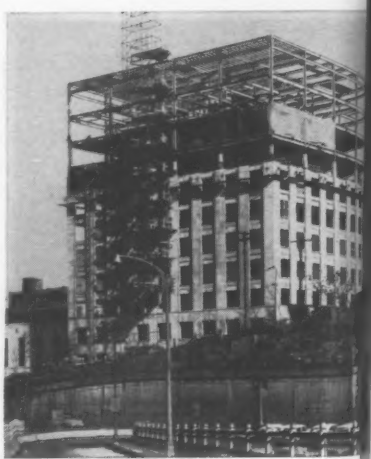

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CAT* D8 Tractor with No. 8U Bulldozer (foreground) and a DW15 Tractor paired with Scraper (right) are members of the Caterpillar team that beat the Embudo Dam job contract date by 24 days.

O. D. Cowart, owner of the spread working the Embudo project, stands beside his pride and joy, a big D9 used for push loading.

Contractor Cowart got the Embudo Dam project on low bid. It involved handling about 700,000 cu. yd., mostly sand and gravel. Mr. Cowart began with two 7-hour shifts, 7 days a week, and a month later was able to switch to a 2-shift, 6-day-per-week schedule.

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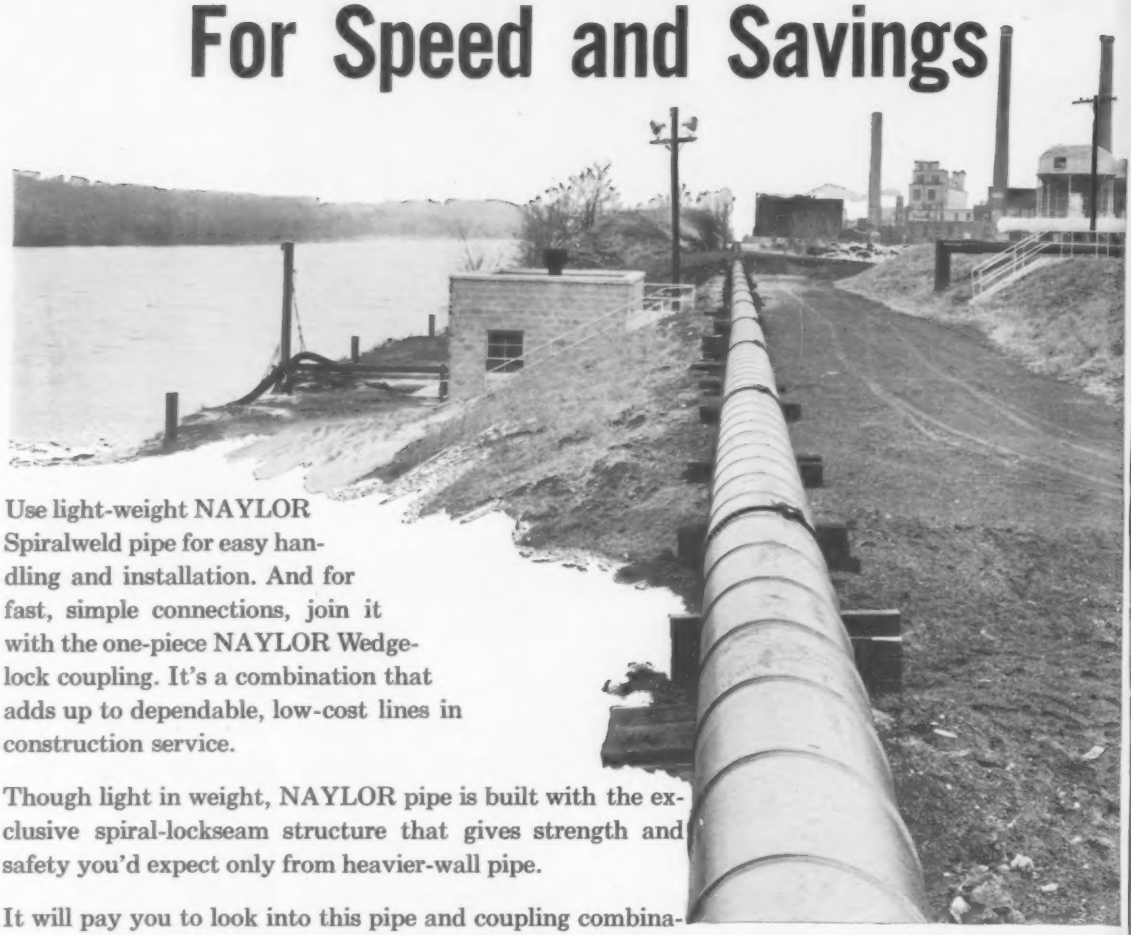

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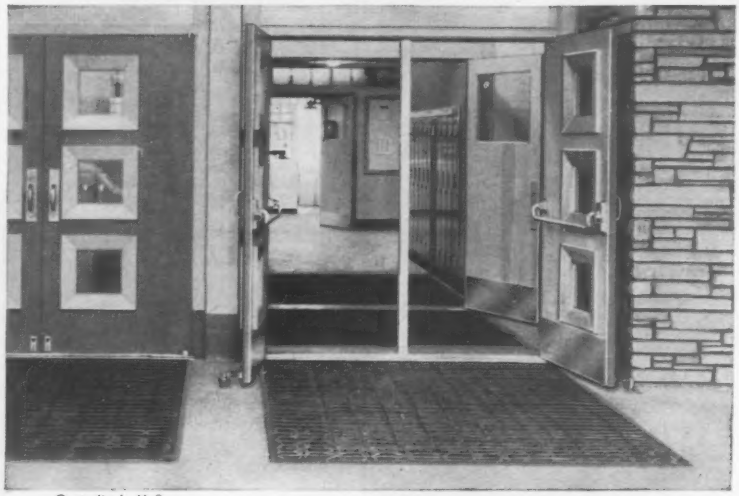

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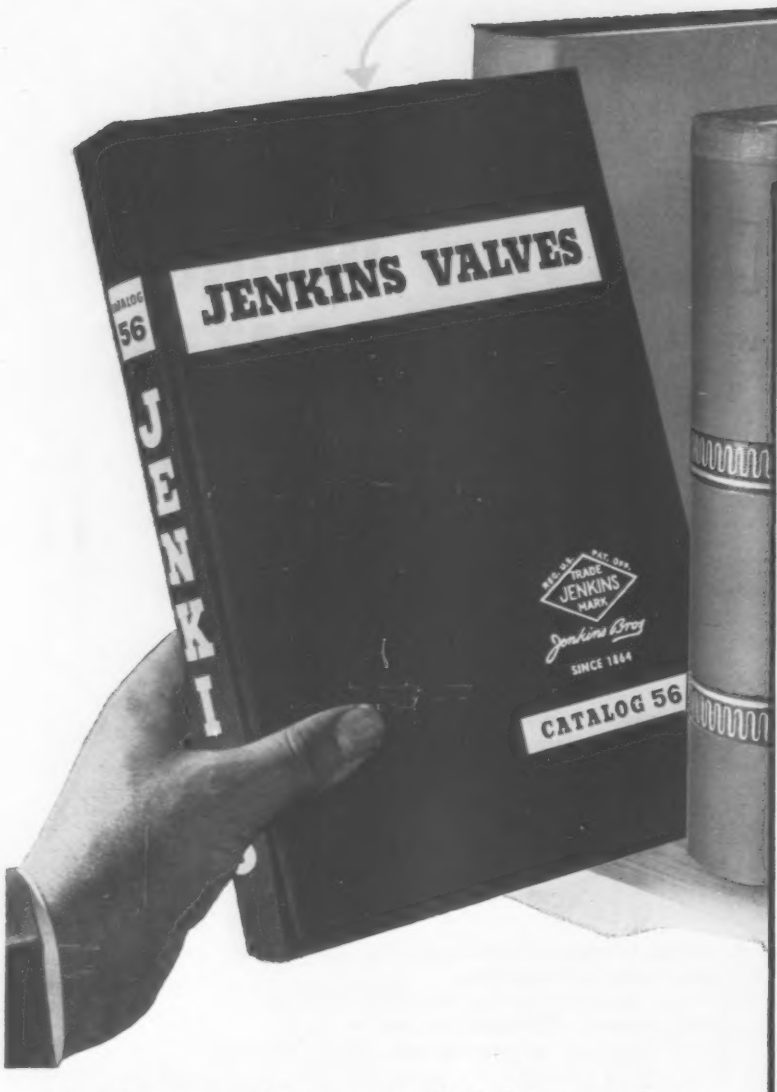

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ENGINEERING NEWS-RECORD

Vol. 160, No. 22 May 29, 1958

Number of copies printed this issue 83,409

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THE CONSTRUCTION WEEK

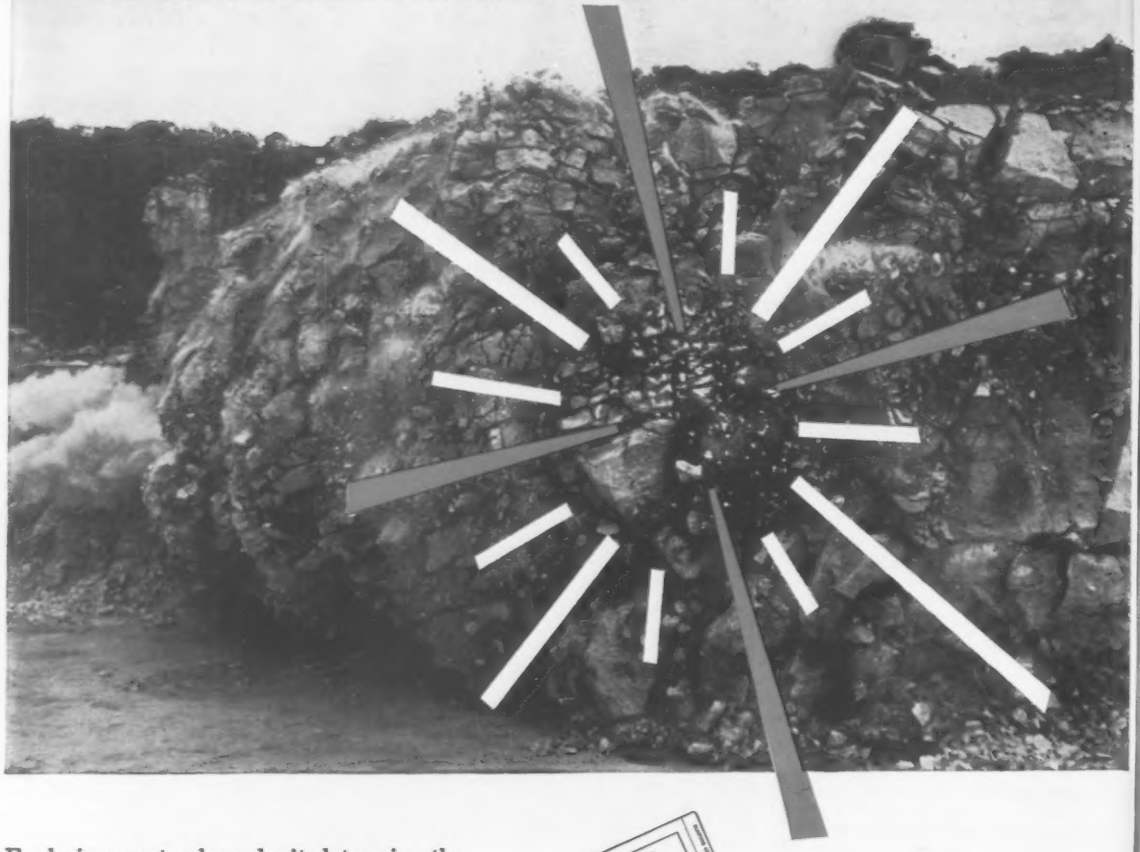
$137 MILLION CONTRACT BEING NEGOTIATED—The Chesapeake Bay Ferry Commission has announced that it is negotiating with four unnamed firms for the construction of a $137 million modified bridge-tunnel crossing of Chesapeake Bay. Original plans for the 17.5 mile link have been vigorously opposed by Baltimore shipping interests on the grounds that a proposed 1,700 ft high-level span would constitute a navigational hazard. New plans submitted by Sverdrup and Parcel, St. Louis consultants for the commission, call for replacement of the controversial bridge with a 6,000 ft tunnel beneath Baltimore channel. With the shippers mollified, the commission expects to start selling bonds in September.

PRESTRESSED BRIDGES—New York State's Public Works Department last week awarded a $2 million contract for construction of twin highway bridges to have 320 ft prestressed concrete girder spans, longest in the U.S. Announced in this column last July 25 as a project under study, the pair of side-by-side bridges will carry interstate Route 505 across Oneida Lake outlet just north of Syracuse. Terry Contracting, Inc., of New York City, is the contractor. Summers & Munninger, of Albany, designed the structures. Still holding the U.S. span record for prestressed concrete beams at the moment are the first ever started here, the 160 ft beams of Philadelphia's Walnut Lane Bridge designed by Preload Corp., of New York City, and erected in 1949. But at the Little Falls pumping station of the Washington, D.C., water system, the James McHugh Construction Co., of Chicago, now is building a prestressed concrete access bridge 281 ft long and incorporating a 216 ft clear span that appears likely to hold the record for a short time. Black & Veatch, of Kansas City, designed it.

NEW STUDY, NO RESTRICTIONS—The California Toll Bridge Authority will direct yet another study of possible new vehicular crossing of San Francisco Bay. But this time, investigators will not be restricted to any given location. Most recently, authority engineers looked at a specific $250 million southern crossing of the bay, found it unfeasible at a 25 cent vehicular toll.

$55 MILLION FREEWAY—City Council and Bureau of Public Roads approvals can be expected for a 13.5 mi freeway the Iowa Highway Commission has proposed for Des Moines and West Des Moines. The facility will have 21 interchanges and is estimated by consultants Howard, Needles, Tammen & Bergendoff to cost $55 million.

HOW MUCH DID THIS BLAST COST?



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WASHINGTON OBSERVER

- **Teamster lawyer on union's board of monitors**
- **Democrats push $1 billion airport program**
- **Atomic power plant construction looks better**
- **Navy's Bureau of Yards and Docks gets new name**

● **The court-appointed three-man board of monitors who watch over teamster affairs has a new chairman—one-time teamster attorney Martin F. O'Donoghue.**

Mr. O'Donoghue, plumbers' union lawyer, represented teamster president Jimmy Hoffa when insurgents took his election to court. Critics claim this gives President Hoffa three watch-dogs favorable to him and his cause; others say that attorney O'Donoghue also is close to AFL-CIO President George Meany, who led the fight to oust Jimmy Hoffa from the AFL-CIO.

—

● **President Eisenhower will be presented with a hard choice on a $1 billion airport program** the Democrats are getting ready to pass. Their aid-to-airport program calls for new federal grants totaling $512 million through fiscal year 1963. The funds are matched by local governments on a 50-50 basis.

$75 million would be handed out immediately to start construction of projects ready to go. Then $37 million would be added to the $63 million already allocated for the year beginning July 1. For the next four years the proposal would allot $100 million per year (a substantial increase over the four year program of $63 million a year begun in fiscal year of 1956).

Stepped-up airport construction was one of the early Democratic anti-recession public works measures. It has solid backing from the communities, and presumably strong public support.

President Eisenhower has been opposed to continuing even the $63 million grant program.

—

● **At least three "partnership" atomic power plants—to cost around $73 million—appear to be getting the green light.** Democrats on the Joint Congressional Atomic Committee—who have been feuding with Adm. Strauss of the AEC—aren't objecting to AEC plans to subsidize their construction.

The projects would be built by a group of private companies (Carolinas Virginia Nuclear Power Associates), a municipality (Piqua, Ohio), and a rural co-op (Rural Cooperative Power Association of Elk River, Minn.).

The fight still goes on, though, over the building of federal power plants. The Democrats now talk for two plants: One to be a plutonium-producer at Hanford, which would also supply electric power there; the other a gas-cooled design similar to those the British have in operation.

—

● **The 116-year-old Bureau of Yards and Docks of the Navy will get a new name before Congress goes home.** The new name: The Bureau of Civil Engineering. Draft legislation was sent to Congress a year ago, after talking about the change for some years.

The idea is to give the bureau a name more descriptive of what the agency's job really is. "Yards and Docks," derives from the days when the Navy's shore establishment consisted mainly of shipyards. Actually, the bureau's responsibility covers design, construction and maintenance of all types of shore facilities, including airfields, housing, highways, utilities, and even floating drydocks.

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Aggressive Selling—A Key to Contracts

The nation's construction industry could stimulate its contract volume and at the same time give a boost to the economy, right now by doing a selling job on manufacturing industry. For some of the country's major manufacturing companies are in a mood to be sold on construction despite a decline in their sales and earnings. This point was brought out forcefully last week in New York City when close to 2,000 top businessmen met at an Economic Mobilization Conference sponsored by the American Management Association.

President Eisenhower used the occasion to deliver a talk billed as a major policy address. He was among those who called attention to many of "the 4.3 million individual businesses in this country" that need some modernization or improvement.

"What time could be better than the present for making these outlays?" the President asked. He then added that "money and materials are more readily available today, and in many cases on better terms, than they have been for some time—or than they may be for some time."

PRESIDENT EISENHOWER says that now is a favorable time to invest in modern plants during a talk at American Management Association's Economic Mobilization Conference.

• **Executives recognize their needs**—Prior to the President's message, participants had acknowledged those economic facts. The principal speakers on the program and the delegates on the floor spent two days telling each other (and the nation) that what is needed are new, low-cost production facilities—and aggressive salesmanship.

The latter attribute is one that contractors and consulting engineers could use to provide the new plants that industry in many cases admits it needs to replace high-production-cost installations. Obsolescence is the chink that shows in industrial armor.

Industrial chieftains even went out of their way to admit that right now is the time to buy, because construction costs are down. The same men also expressed belief that the current economic downturn will not be with us for long and that when the upturn does occur, building costs will follow along. They then will have lost the opportunity to acquire facilities at advantageous prices.

There is one segment of American business that is moving in on a favorable situation—the food chain stores. The board chairman of one such company, Franklin J. Lunding of Jewel Tea Co., Inc., said that the firm will spend $18 million on expansion this year. That is more than double last year's expenditure. He added that he was glad to note that the company will be able to build the new facilities for 15 cents a square foot less than in 1954.

To the construction industry, the food chain industry offers a fertile field of business. The chains expect to build this year 2,000 new supermarkets and another 1,700 will be remodeled. To serve these new stores and some enlarged units, additional warehouse area and other subsidiary facilities will be required, thus the pool of available building business in just one field is greatly increased.

• **In other industries**—The food industry, however, is one that is burgeoning, so perhaps it would be expected that it would gladly put new money on the line. But one that has suffered recently is air conditioning.

From this sector, however, came encouraging words. Cloud Wampler, board chairman of Carrier Corp., who said the company was "clobbered" in the first fiscal quarter, is in the market for new plants. Mr. Wampler drove home the fact that in industry as a

whole, much capacity is outdated. He said, "True, excess capacity exists today. But a lot of this is represented by facilities that should be abandoned in favor of plants that represent the very last word in efficiency."

It is just such capacity that Carrier intends to replace this year. For 1959, the plans of the company have not been completed. They are being formulated. He emphasized that it is "the present business situation that is inspiring us to lay plans for further improvement, and therefore, greater investment than would have been the case otherwise."

Thomas J. Watson, Jr., president of International Business Machines, was another who called attention to the fact that "building costs are down slightly." The company, therefore, has not cancelled or slowed any of its capital investment plans, Mr. Watson said, because "When times improve, building costs will go up, so we're carrying on."

• **Overseas investment**—But opportunities for obtaining construction contracts are not limited to this country alone. There also is business to be done abroad. More and more, American industry is expanding its existing foreign facilities and some for the first time are stepping outside the continental limits of the United States.

Thomas B. McCabe, president of Scott Paper Co., said that his company now more often refers to the international scene when considering sales and markets. His company's first substantial investment outside this nation was made in 1954 and, he said, since then "We have been very encouraged about the prospects of foreign markets."

So the firm's plans now "call for considering possibilities of substantially increasing our interests abroad, for in the foreign field, too, we see great opportunities."

Obviously that company is not alone in its thinking. But this type of business will not necessarily be dropped in the lap of building companies. Sales efforts by the construction industry must be stepped up in this direction.

All of which returns to the main theme of the entire conference—more aggressive salesmanship. This was the basic idea carried away from the session by those present, and one that can be most valuable to contractors and consulting engineers, who now can use lower building costs as an additional lever.

Industry obviously is in a frame of mind to be sold on replacing obsolete and obsolescent plants. Many are preparing to expand abroad. Both of these circumstances are to the advantage of the construction industry.

H. C. Turner, Jr., president of Turner Construction Co., New York City, was among those at the conference. Commenting later, he said he was forcefully impressed by the constant talk of large amounts of inefficient plant represented in the overall capacity of industry today. "I heard it from the dozen or so speakers on the rostrum and I heard it on all sides of me in conversation on the floor," Mr. Turner said.

He explained that his sales staff had much earlier been instructed to hit at the need of replacing outdated facilities, "but now the staff will hear much more from me on this point from now on."

States' Estimating Expected to Stand Scrutiny

Findings favorable to the Bureau of Public Roads and to the state highway departments are expected to flow out of Senate hearings, scheduled for July 7, to inquire into the validity of estimating procedures employed by the state agencies who are building the interstate road system.

Allocations of federal funds to the states for interstate highway construction aren't likely to be affected by this Congressional inquiry into alleged nonuniformity of interstate cost estimates by the 52 highway departments that receive federal aid for interstate projects. To the contrary, the testimony to be given at the hearings is expected to remove all doubts from the minds of the legislators as to the reliability of the cost estimates prepared by experienced state highway engineers.

These predictions, concurred in by nearly all observers who know the full highway story, form the basis of informed Washington opinion six weeks in advance of the open hearings. Senator Albert Gore, chairman of the roads subcommittee of the Senate's public works body, is calling his group together on the first Monday of July for this one purpose: To learn from Highway Administrator Bertram F. Tallamy and from the state highway officials whether or not there is any truth in allegations that the various highway departments did not adhere strictly to regulations in preparing their 1957 estimates of the cost of completing the interstate mileage in their states.

At the root of the inquiry is a 100 page report by the General Accounting Office released last week with considerable fanfare by Senator Gore. This document reports GAO findings with regard to estimating methods used by 11 selected highway departments in computing the 1957 estimates of interstate construction costs for their states.

Overall, the report is only mildly critical of indicated variations among the state highway departments in applying their individual estimating systems to calculation of interstate costs. It is also mildly critical of the states' allegedly having upgraded their design standards.

Interstate cost estimates made by the states last year and adopted this year by Congress form the basis for apportioning the multiple billions of federal interstate funds to the highway departments for fiscal 1960, 1961 and 1962. In the widely publicized comments that accompanied his release of the GAO report, Senator Gore correctly stated that nothing could be done to recall allocations already made to the states for fiscal 1960. But he implied that the states and BPR might be called upon to make revised cost estimates before interstate federal aid for fiscal 1961 is definitely allotted by the Secretary of Commerce to the states.

This fiscal 1961 allocation normally would go to the states on July 1 of this year. It is possible that the Gore committee hearings may delay the apportionment for a while, but Washington observers agree that the amount going to each state won't be changed in any significant way by the Gore inquiry.

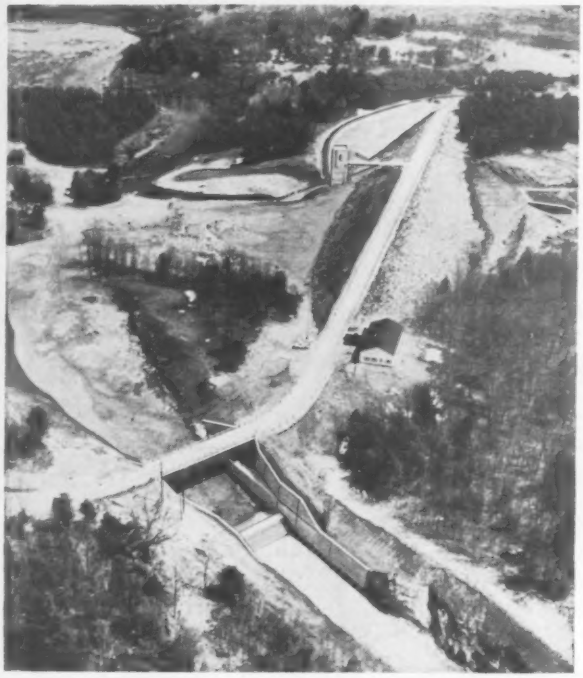
Highway officials of the 11 states surveyed by GAO are meeting this week in Washington with national officers of their association to go over the specific criticisms implied in the GAO review of their estimating practices. They will then go back home to make an exhaustive analysis of their 1957 estimates—and to prepare themselves to present a vigorous substantiation of the engineering-estimating competence and integrity of their highway department personnel to the Senate roads subcommittee in July.

High Australian Praises American Contractors

The chairman of the Snowy Mountains Authority, Sir William Hudson, vigorously praised the American contractors working on Australia's $1 billion hydro power scheme.

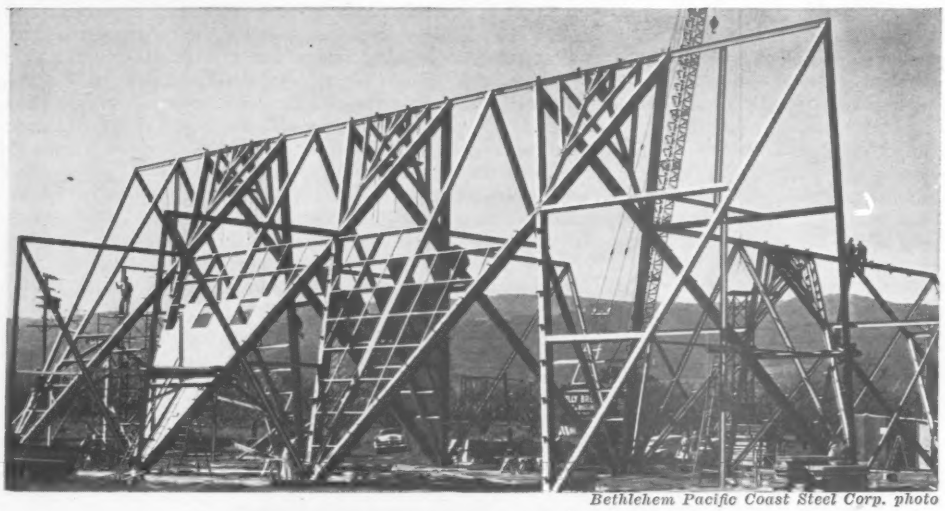
Sir William said the U.S. contractors were good teachers for the Australians. Referring to the Kaiser-Walsh-Perini-Raymond joint venture working in the Eucumbene Tunnel, he noted an American firm would shortly complete a contract after only two years' work although the job originally was scheduled to take four years.

Sir William also disclosed that every inducement had been offered to British firms to participate in the bidding for Snowy Mountains jobs, but to no avail.



Flood Reservoir Built Fast

First of the half dozen flood control projects rushed to construction in New England after the calamitous hurricanes of 1955 was dedicated May 16. This is the $2 million Baree Falls Dam in Massachusetts on a tributary of the Connecticut River, which went under construction in June 1956. The main earth and rockfill dam is 885 ft long and 62 ft high and is flanked by 3,215 ft of dikes. The 24,300 acre-ft reservoir created is controlled by a gated concrete chute-type spillway. Two other New England flood control dams, Buffumville and Otter Brook, are scheduled for August and September completion, respectively.



Bethlehem Pacific Coast Steel Corp. photo

Triangles of Steel Frame a California Church

Steel frame for First Congregational Church of Sunnyvale, Calif., is complex assembly of triangular shapes. With equilateral triangles predominating, church is 52 ft wide and slopes 52 ft to peak. Steel frame was selected by architect Wilfred E. Blessing of San Jose, Calif., for architectural effect and lightness. Problem of detailing frame was handled by structural engineer H. Neil Warren & Siebert, Palo Alto. Biggest member is 16 in., 40 lb wide-flange beam. Joints are shop welded and field bolted, with some minor field welding. Fabrication was handled by Pittsburgh-Des Moines Steel Co.

FIRST TEN YEARS WORK is to cost proposed metropolitan district $83 million. Inset indicates future 575 sq mi service area.

Seattle Gets $164 Million Sewage Plan

A $164 million sewage works construction program has been proposed for the Seattle metropolitan area in a report prepared by the San Francisco consulting firm of Brown & Caldwell. Of this amount, $83 million would be spent by 1970.

The report also urges storm drain and combined sewer separation programs estimated at $214 million. And it suggests establishment of a central regional agency to administer all of the proposed construction.

Nearly 600 pages long, the monumental report is the result of a 1½ year study by the consultants. The investigation was sponsored jointly by the City of Seattle, King County and the State of Washington Pollution Control Commission with the cost split as follows: city, $90,000; county, $30,000 and state, $10,000.

Seattle is pinched between Puget Sound to the west and Lake Washington to the east. Recent years have seen the city grow both to the north and to the south by annexation. And its suburban area includes land east of Lake Washington where there is a tremendous potential for population growth. Thus, the study included a 575 sq mi area containing 19 incorporated municipalities. Present population of this area is 864,000. The report estimates 1980 population at 1,260,000 and year 2030 population at 2,240,000.

The study area includes 15 operating sewerage systems and eight semi-public and private systems. Existing treatment plants—almost all of them primary plants—have 28 mgd dry weather flow capacity. Over 50 mgd of sewage flow is discharged without treatment. And only 70% of the population is served by sewers.

• **Two major systems**—Detailed studies were made to develop a comprehensive sewerage plan for the area. Two major systems and several minor systems were recommended.

One of the major systems would take sewage flow from west and south of Lake Washington to a complete treatment plant in the Renton area. Using the activated sludge process, this plant would have an initial capacity of 24 mgd and ultimate capacity of 144 mgd. It would discharge effluent into the Duwamish River with sludge lagooned.

The second major system would handle sewage from almost the entire city of Seattle plus extensive areas to the north. The treatment plant would be located on Puget Sound at West Point, which is just south of the ship channel that connects the sound and Lake Washington. Initially, this primary plant would be built to full capacity, 118 mgd average dry weather flow.

The plant would include grit removal, bar screens, preaeration, sedimentation, sludge digestion and chlorination. Effluent would be discharged to Puget Sound through a 3,700 ft outfall terminating at a 150 ft water depth. Digested sludge would be discharged through a 4,000 ft outfall into a 400 ft depth of water.

Proposal of this West Point plan capitalizes on the realization in recent years by Seattle area people that the vast waters of Puget Sound are indeed becoming polluted from raw sewage discharge.

• **Stage construction**—The report breaks the necessary sewerage construction into three stages. Stage 1, to be undertaken from 1960 to 1970, is estimated at $83 million. About $47 million of this would finance facilities within Seattle, $30 million would be for facilities east of Lake Washington and the rest would be for construction north and south of Seattle along Puget Sound. Stage 1 includes West Point treatment plant, the Renton plant built to 24 mgd capacity, the interceptors shown on the map, and a number of small primary treatment plants.

Stage 2 construction, proposed for accomplishment between 1970 and 1980, would enlarge the Renton plant to 48 mgd and add other facilities for a total estimated price of $35 million. Stage 3 construction, which would be undertaken after 1980 and conclude the 35 year program, would cost $45 million, including expansion of the Renton plant to 144 mgd. All the cost figures are based on present prices using an ENR Construction Cost Index of 800.

• **Storm water**—In addition to sewerage needs, the Brown & Caldwell study looked into storm drain requirements in areas outside of Seattle. Cost of this work approximates $145 million, but

no definitive program has been outlined.

The third phase of the big study delved into a partial separation of the present combined sewerage system inside Seattle city limits. This is figured to cost $69 million.

Financing of the sewerage construction is possible, according to the consultants, through revenue bonds backed up by sewer service charges. Charges would be levied up to $2.50 a month for a house connection. General obligation bond financing is proposed for storm drain construction.

• **Central agency**—The report suggests that the entire program be made the responsibility of a metropolitan sewerage district. The district would be responsible for both sewage and storm drain work of a major nature. This includes service for areas larger than 160 acres for storm drain work and 1,000 acres for sewage work.

Local reaction to the report has so far been good. Seattle's Mayor Gordon S. Clinton says that the study is a thorough job and that Seattle "hopes to proceed" with the recommended work within the city regardless of what is done outside. This, actually, is already under way to a degree as Seattle is working on a six year program developed by City Engineer R. W. Morse that dovetails into the broader Brown & Caldwell program.

An influential councilman is behind an ordinance introduced that would authorize four projects listed in the Brown & Caldwell report as being the city's primary needs. Requiring a $25 million revenue bond issue, these projects include the West Point treatment plant. Bonds would be retired from a $1 a month sewer service charge already in effect in Seattle.

Fate of the Seattle suburban areas is not yet clear. In March, voters turned down establishment of a metropolitan sewer district similar to the one suggested in the Brown & Caldwell report. The proposed district was substantially endorsed by Seattle voters and residents east of Lake Washington. But voters in areas south of Seattle rejected it presumably because they could see no immediate benefits and feared they would be paying for sewers built in other parts of the district. The proposed district also would have had wide powers in other fields, such as mass transportation.

Plans are under way for a new sewer district vote, perhaps in September. The new proposal would exclude, for the time being, the negatively inclined areas to the south and would cover only sewers. Chances of passage appear excellent.

There are no firm plans now for handling suburban storm drains. According to King County Engineer D. L. Evans, the county at present can spend funds only for drainage of roads and not for private property. Enabling legislation is apparently needed to permit the county, separate drainage districts, or the over-all metropolitan district to build storm drains.

Kenneth W. Brown and David H. Caldwell, principals of their firm, and Harold E. Miller supervised preparation of the Brown & Caldwell report. Mr. Miller has been appointed director of the State of Washington Pollution Control Commission effective June 15.

Toughest Waste Problem Beaten

Cost data from pilot operation reveals steel industry can recover pickling acid cheaper than treating it

Hard cost data associated with 18 months operation of a pilot plant that recovers steel pickling liquors were revealed last week at the annual American Iron & Steel Institute meeting in New York. The data showed that it would be considerably cheaper to recover the waste pickle liquor via the new much heralded Ruthner process than to neutralize and dispose of the spent liquor.

Finding an economical method of handling waste pickling liquor—which results from the removal of scale from steel emersed in a sulphuric acid solution—has long been the steel industry's biggest pollution problem. Results from the pilot plant built by the Blaw-Knox Co. indicate the Ruthner process can do the job at less than half the cost of lime neutralization. But the recovery process still costs 1.7 times more than no treatment at all of pickling liquor, assuming existing steel-making pickling procedures.

The actual numbers involved are these, based on costs scaled up for 100,000 gal per day of waste pickling liquor (steel industry's total production is 17 times this figure). Deducting a credit for 29,442 tons of recovered sulphuric acid, treatment by the Ruthner process costs $15.40 per ton of sulphuric acid recovered. Neutralization and disposal costs $32.60 per ton, or more than double the Ruthner process figure. The cost per gal figures are found to be 1.29 cents and 2.7 cents, respectively.

Because a 100,000 gpd recovery plant requires an initial investment of $4.5 million, versus about $900,000 for equivalent neutralization facilities, the payout period for the Blaw-Knox type plant is 8½ years.

The steel industry will look at the figures in another way. Since sulphuric acid costs $22 per ton, the recovery process costs $37.40 ($22 plus $15.40) to produce a ton of sulphuric acid versus $22 a ton for new acid if the pickling liquor were discharged raw. On the same basis, neutralization would cost $54.60 per ton.

As a rough indicator, yearly cost to the steel industry for recovering all of its waste pickle liquor would run $7.6 million (17x29,442x$15.40). Capital investment necessary is about $77 million.

• **Possible switch**—The above costs are based on recovering a waste pickle liquor containing 8.5% of free sulphuric acid, which is representative of current practice. However, the steel industry has been showing considerable interest in the use of high acid pickling, with free acid content as high as 25%.

The steel industry report given at the AISI meeting did not go into this possibility. But a paper given in December 1955, by T. F. Barnhart, senior process engineer of the Blaw-Knox Co., indicated that it might cost only 40% as much to recover 25% acid pickling liquor as 5%. Thus, use of high acid pickling in conjunction with the Ruthner recovery process could conceivably be cheaper than even discharging untreated pickling liquor.

Last week's revealing report was presented by J. H. Strassburger of National Steel Corp., representing seven steel companies and Blaw-Knox who banded together to finance the $500,000 pilot plant program on the Ruthner process. The plant began operation in September 1956.

The basic recovery process was developed by Othmar Ruthner of Austria after World War II. Blaw-Knox obtained exclusive rights to the process in North and South America and modified it to suit American equipment. Steel industry interest in the process was an outgrowth of the activities of the Steel Industry Action Committee of the Ohio River Valley Water Sanitation Commission.

Chemistry of the Ruthner process is basically simple. In the pickling bath, iron oxide and sulphuric acid form ferrous sulphate which is sent to a reactor. Here, hydrogen chloride gas is bubbled through to form ferrous chloride and sulphuric acid, the latter being returned to the pickling bath after centrifuging and de-gassing the ferrous chloride is then combined with steam in a roaster to form hydrogen chloride (which is recycled to the reactor) and iron oxide, the only end product but one which has value as recharge to a blast furnace.

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A SOLID FUTURE...

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On the Indiana Toll Road th

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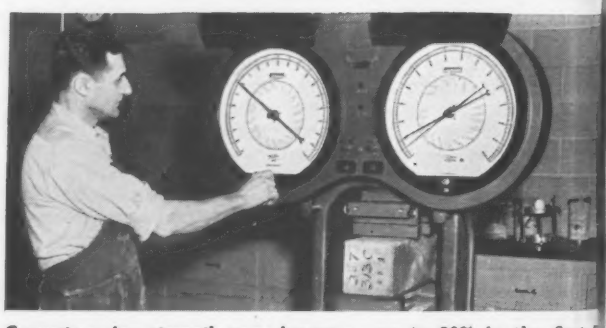

Concrete gains strength year by year—up to 20% in the first 5 years. Actual tests of flexural strength prove it. Here's a valuable load-bearing "bonus" that only concrete gives!

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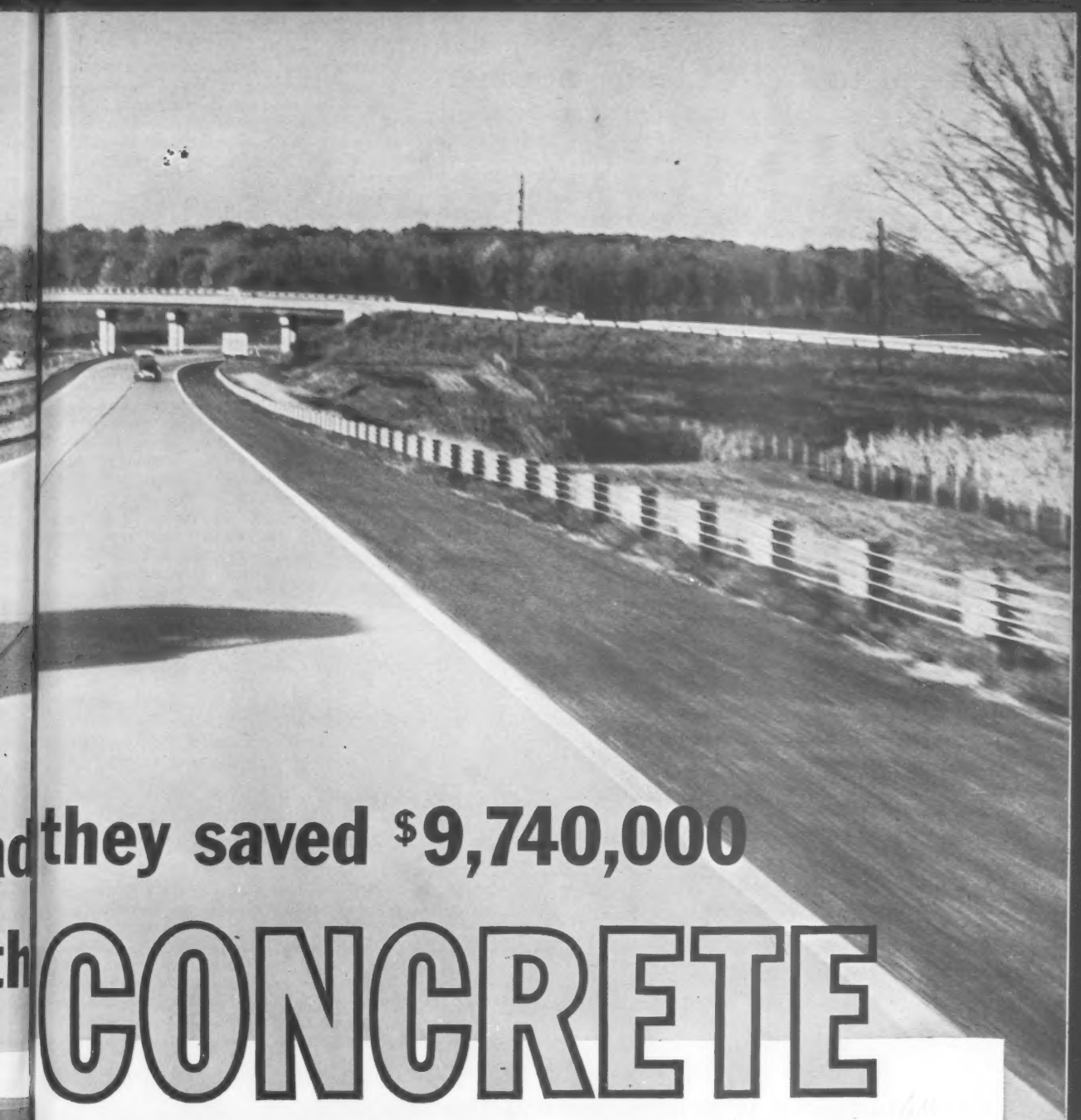

they saved $9,740,000

CONCRETE

Actual cost figures for the two types of pavement tell the story! Indiana Toll Road engineers drew up designs for both types of pavement . . . each to carry the same axle loads, each to be the best of its type. Realistic comparison of *all* paving costs, from grading and subbase preparation to finished surface, gave the answer: *Concrete would save $62,436 per mile!*

Indiana's experience demonstrates once more that concrete can give lower initial cost. And you get a pavement of mathematically accurate load-bearing strength—with a safety factor for overloads.

Add to this, concrete's life expectancy of 50 years and more, with far lower maintenance costs. Add "thump-free" smoothness that pleases the public . . . and the all-weather safety the grainy surface gives. On Interstate highways and all heavy-duty roads, modern concrete puts quality within your budget.

PORTLAND CEMENT ASSOCIATION

A national organization to improve and extend the uses of concrete

System to Get "Clean" Sewage

The Allegheny County Sanitary Authority, now building a $100 million collection and treatment system in and around Pittsburgh, was sure this week of getting an extremely comprehensive ordinance passed to protect its system from troublesome waste discharges.

Pittsburgh City Council was expected to enact a law prohibiting dumping of septic tank sludge into sewers or treatment plant, discharge of neutralized acid wastes and installation of new garbage grinders over 3 hp.

Also barred from the big new system are metal pickling liquors, phenols, cyanides, meat processing solids, gas tar, fruit pulp, wastes containing over 100 ppm of grease, feathers, garbage and discharges with pH less than 5.5 or greater than 9.0.

The Allegheny County Health Department had objected to the septic tank provision, seeking permission to allow sludge drawn from the area's 40,000 septic tanks to be dumped down convenient manholes. ACSA Chief Engineer John F. Laboon answered that the septic sludge would cause odor problems, excessive sludge deposits in the system and would seriously reduce the expected 50% BOD removal rate by the system's primary facilities. Further, it would encourage the retention of septic tanks in areas that should have sewers.

In regard to the garbage grinder limit, Mr. Laboon is aiming at the big 7½ hp units used in many supermarkets. However, he also said users of smaller grinders would have to pay a fee to operate them, in proportion to the additional load they introduce at the treatment plant.

Although some of the industrial waste bans appear to be quite restrictive, Mr. Laboon indicated that ACSA's attitude would be to take what was reasonable at first to determine the effect on plant operation.

Completion of the authority's 69 miles of interceptor sewer and 150 mgd treatment plant to serve 71 municipalities, including Pittsburgh, is scheduled for March 1959. The treatment plant consists of screens and grinders, aerated grit chambers, preaeration and sedimentation tanks, Laboon process concentration of undigested sludge, incineration and pre- and post-chlorination.

Space at the treatment plant site, three miles downstream from the Golden Triangle, has been provided for future secondary treatment. The collection system consists of extra high strength precast concrete pipe none of which is being lined with a protective coating.

Manhattan Motel to Bridge Railroad Tracks

Plans to construct Manhattan's first motel were announced last week by Motel City, Inc., and the New York Central Railroad.

The 400 room development will cover 2½ acres of the railroad's west side track system from 40th to 44th St., midway between 10th and 11th Ave. Construction, estimated to cost $4 million, is scheduled to start this fall. Completion is set for June 1960. Each of four sections will be opened as it is finished.

The motel will be completely air-conditioned. Sound- and fire-resistant construction will be used. The street level, 20 ft or more above the railroad tracks, will include parking and service areas. Two-story Dutch-colonial-type buildings will surround landscaped courts at the second level. The architectural firm of Wechsler & Schimenti, New York, is preparing plans.

Close to the Lincoln Tunnel and West Side Highway, the motel will be convenient to midtown stores and theaters as well as ship, train and air terminals.

Canadians to Russia

Exchange visits planned for Canadian engineers

Exchange visits between Canadian and Russian engineers are being planned by the Engineering Institute of Canada. This was announced during the institute's annual convention at Quebec City last week.

President C. M. Anson of Sydney, Nova Scotia, said that visits were being planned in cooperation with the Canadian government. Four Russian engineers have recently toured Canada with assistance from EIC members; the planned reciprocal visits would enable Canadian engineers to know better the work that is being carried out by Soviet engineers.

Succeeding Mr. Anson as president is Kenneth F. Tupper, president of Ewbank and Partners Ltd., consulting mechanical engineers of Toronto. Mr. Tupper stressed that the proposed visits to Russia would result in a better understanding between Canada and the USSR and would bring new and beneficial information to engineers of both countries.

Business reports at the EIC convention showed that the institute had made progress during the past year in all its main functions. Of special note was the publication of regular transactions to supplement the Engineering Journal. Now being published four times a year, the transactions are to contain papers of special engineering or scientific importance. Copies of the transactions are being distributed to all members.

Honors in the form of medals were bestowed on R. E. Heartz, president Shawinigan Engineering Co., Montreal, and R. E. Jamieson, dean emeritus of engineering at McGill University. Among the honorary members elected at the meeting was the general secretary of the institute, L. Austin Wright, who is retiring after 20 years of service to the institute, to which many tributes were paid.

Mr. Wright will be succeeded on June 1 by Garnet Page, deputy general secretary, who joined the EIC staff a year ago after serving the Chemical Institute of Canada as secretary.

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Construction fasteners are our specialty. Besides maintaining large stocks of the more popular styles of fasteners used in construction work, we can make almost any kind of special fastener. Special heads, threads, lengths—you name it, we'll make it. Whether you need a dozen or a carload, we're geared for fast service.

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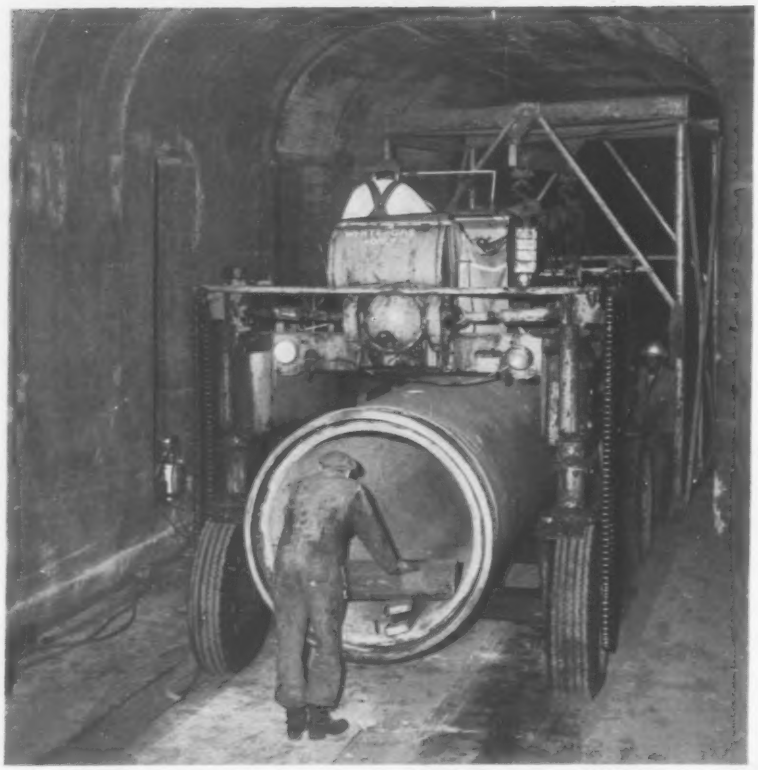
BETHLEHEM STEEL

Water Main Takes Subway Crosstown



OLD SUBWAY TUNNEL, that never saw a train, now finds use as right of way for 48 in. water main in downtown Cincinnati. Straddle carrier brings pipe from mouth of tunnel and places it before previously laid section where . . .

Cincinnati finally found a use for a 30-year-old subway tunnel that never saw a train when, by happy circumstance, its route was on a direct line with a porposed transmission main needed to carry water through the heart of the downtown area to outlying suburbs. More than 11,000 ft of a 14,000 ft long, 48 in. dia main was laid in the subway.

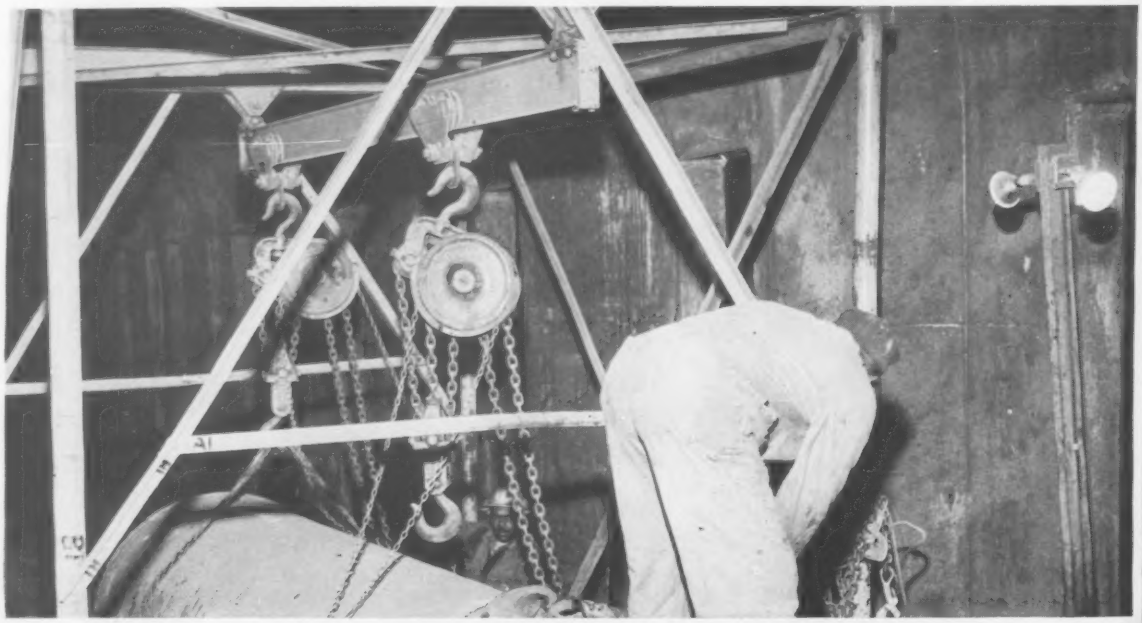
Besides finding a use for the tube, which was never completed as a subway because of changes in the city's growth pattern, the problems of laying pipe through some of the city's most heavily traveled streets were avoided entirely.

The new water main is of prestressed concrete steel cylinder pipe. The standard steel and rubber gasket joint for this pipe provides for the greater amount of temperature expansion and contraction expected, compared with pipe buried in the ground.

The tunnel's long radial curves were handled by standard 16 ft sections of pipe with beveled ends allowing 4 deg deflections at the joints. Alignment at other curves was made by "cracking" the joint up to ½ in.

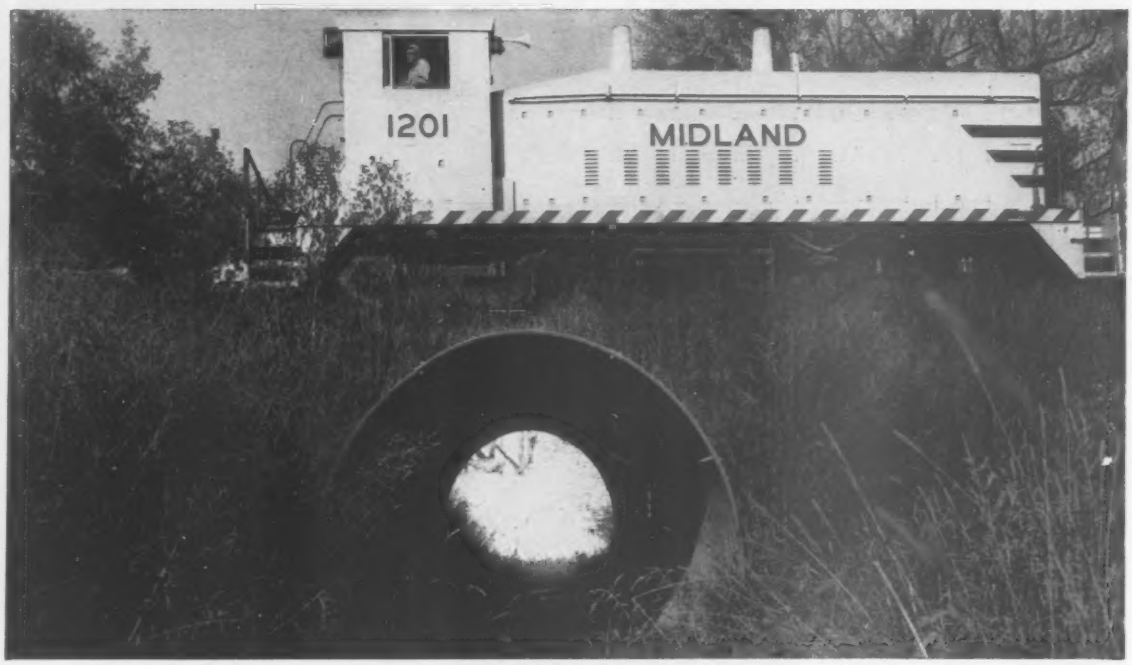
• **Pipelaying**—Pipe was moved from the mouth of the tunnel by a straddle carrier to the front of the previously installed bell end.

As the carrier backed away, it pulled a portable A-frame into position over



PORTABLE A-FRAME to suspend pipe is pulled into position as carrier backs off. Jack pulls pipe home.

"Armco Drainage Structures help us speed up installation"



Under this industrial railroad to the Midland Collieries, Inc., is an Armco MULTI-PLATE Pipe, 102 inches in diameter. Many other Armco Drainage Structures are installed under this same line.

So said Mr. H. W. Hartmann, Vice President of McDougal-Hartmann Co., well-known engineers and contractors of Peoria, Illinois. He was referring to his company's installation of Armco Corrugated Metal Drainage Structures on a nine-mile railroad line for Midland Collieries, Inc., of Victoria, Illinois.

Time was an important factor in this job because the coal corporation wanted to use the railroad before winter set in. Not only did the contractor find the Armco Structures time saving, but Mr. Hartmann also said, "Armco Structures were more economical to install."

The drainage project—involving Armco MULTI-PLATE® Pipe and Pipe-Arch—included a total of 8 structures; diameters (or equivalent) range from 78 to 168 inches, and have a total length of 566 feet.

• • •

Corrugated Metal Drainage Structures comprise just one group of the more than 30 Armco products. They are available from hundreds of experienced Armco salesmen located in more than 175 cities, and in close proximity to one of the more than 50 Armco fabricating plants. Use coupon for more data. Armco Drainage & Metal Products, Inc., 3088 Curtis Street, Middletown, Ohio. Subsidiary of Armco Steel Corporation. In Canada: write Guelph, Ontario. Export: The Armco International Corporation.

ARMCO CONSTRUCTION PRODUCTS

Here is another Armco MULTI-PLATE Pipe, 168 inches in diameter, in final stages of assembly, for installation under the same railroad line.

FREE — **POCKET-SIZE INSTALLATION MANUAL**

Armco Drainage & Metal Products, Inc.
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☐ Send me my copy of the free installation manual on Armco Corrugated Metal Drainage Structures.

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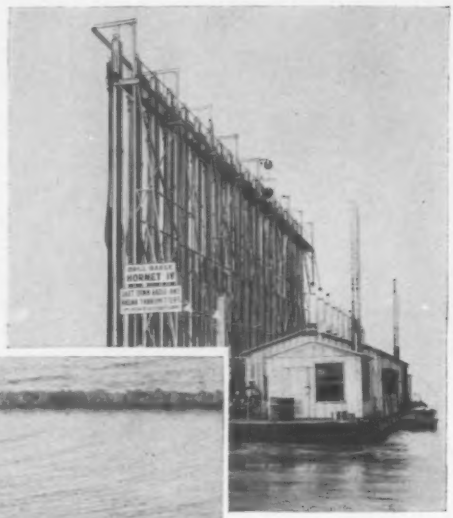
Photo to the right illustrates the drill barge HORNET IV used in the Amherstburg Channel deepening project by contractors Marine Operators of Windsor. This 20 drill rig including compressors and diesels is mounted on a 160' x 30' sectional barge made up of 11 sections. 40 foot spuds are used to position the barge.



A clam operation off the rock bound shore of Lake Superior. The crane is mounted on a 4 section barge which was transported by highway to the site.

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The Manitowoc Porta-Float is the smaller version of the sectional barge. The standard basic float is 32' x 8' x 4'. Units can be pinned together to make a wide variety of sizes and arrangements. Economical and versatile for floating all types of contractors' equipment. Ideal for floating docks, piers, etc. Porta-Floats are easily transported on trucks as illustrated below.

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. . . Pipeline in subway

CONCRETE FOR THE SADDLES placed about 300 ft behind pipelaying crew.

the new pipe. Slings passed under the pipe supported it as two chain hoists suspended from an overhead rail on the frame put the pipe into vertical alignment. Jacks braced against the tunnel wall aligned the pipe horizontally.

After a feeler gage checked the inside joint tolerances, a jack pulled the pipe home. Wood blocks supported the pipe until concrete saddles were placed.

About 300 ft behind the pipelaying crew, another group installed concrete saddles. The saddles were cast in place —two for every pipe section.

Truck mixers using the adjacent subway tube as a roadway, delivered concrete through holes in the wall every 150 ft. A narrow-base lift truck operation between the pipe and the wall moved concrete to the saddle being cast.

Protected from weather and with no excavation or backfilling needed, a regular laying schedule was maintained. Between 16 and 20 sections a day were installed. Only a portion of the 3,000 ft of pipe outside the tunnel remains to be laid. The job is expected to be completed by July 1.

The pipeline was designed by Black & Veatch, Kansas City, Kan., with Edward Farmer in charge. Charles F. Smith and Son, Inc., Kennett Square, Pa., is general contractor. Price Brothers, Dayton, Ohio, is producing the pipe. William Sahnd and J. H. Rimmer, superintendent and assistant superintendent of water distribution, respectively, are supervising the job for the city of Cincinnati.

JUNIOR CHANNELS
Lightweight J&L
Hot Rolled Channel Sections

Potomac Iron Works is using 10" Junior Channels (8.4# per foot) as stair stringers in this 15-story Baltimore, Maryland, state office building with 12-gauge J&L hot rolled sheet steel as risers. General contractor: Blake Construction Company, Washington, D. C. Architects: Fisher, Nes, Campbell & Associates, Baltimore.

"Clean edges and uniformity of Junior Channels speed stair fabrication"

... states leading architectural metal fabricator

"We have standardized on Junior Channels for stair stringers. They permit us to prefabricate stairs to exact dimensions with a minimum of waste," reports Mr. Milton M. Mulitz, president of the Potomac Iron Works, Inc., Hyattsville, Maryland.

Potomac Iron produced and installed 92 flights of stairs in this 15-story Maryland State Office Building and the adjacent six story Maryland State Roads building in Baltimore. Potomac Iron manufactures over 5,000 prefabricated stair units yearly for residential, apartment and commercial construction.

"Junior Channels are stronger than formed plate channels of equal depth. Yet their minimum steel weight speeds handling and fabrication," says Mr. Mulitz.

Junior Channels, hot rolled sections, are ideally designed for stairway stringers. Straight line simplicity and narrow flanges make possible their use with or without ornamental trim moldings and other modifications.

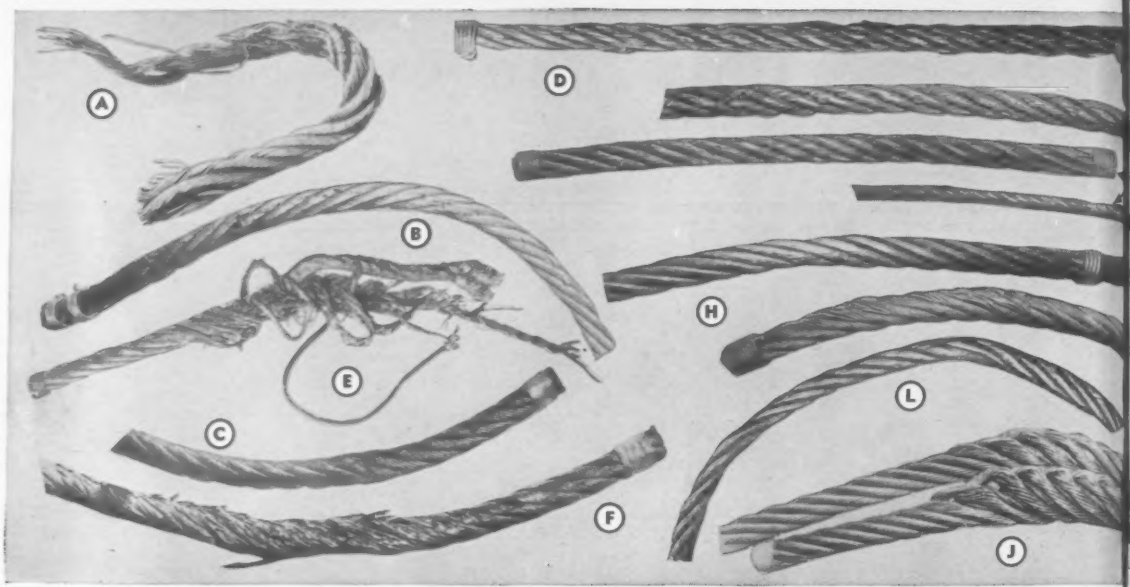
Write today for design data on Junior Channels, available in three sizes: 10"-6.5#; 10"-8.4#; and 12"-10.6# per foot. Write to Jones & Laughlin Steel Corporation, 3 Gateway Center, Pittsburgh 30, Pennsylvania.

J&L STEEL

Jones & Laughlin Steel Corporation

PITTSBURGH, PENNSYLVANIA

Tuffy® Wire Rope



Guard Against these Cripplers and Killers of Wire Rope

Pictured above are some of the results of wire rope abuses. They quickly ruin wire rope efficiency or end rope life abruptly, long before you have had the service you paid for. Even the best wire rope is a sitting duck for these enemies. When you avoid or minimize them, you make real gains in longer rope life, better service and greater economy. Remember, your Tuffy distributor will be glad to work with you against these and other wire rope hazards.

Here are the "case histories" of the untimely wire-rope fatalities and injuries shown in the picture:

A. Mangled in a wedge socket: Here's a result of improper socketing. It was caused by using a poorly designed or worn-out wedge socket. Failure at the dead end can damage other sections of the rope, too.

B. Rusty road to ruin: Rust—No. 1 enemy of steel—takes a heavy toll in wire rope life. An insidious, silent type of killer, rust often does irreparable damage before it's even noticed. The one-strand break shown here resulted when the rope was allowed to become rustbound through lack of lubrication. Tests show that, with other conditions ideal, properly lubricated rope has up to 10 times the life expectancy of dry rope.

C. The crushing blow: The Sunday punch for this piece of wire rope was delivered by a tractor cleat—just one of many crushing injuries caused by rope being run over or banged into by hard, sharp objects. Even the toughest wire rope is no match for this kind of mistreatment.

D. Strangled by a misfit: When the bearing surface of a sheave is too small for the rope diameter, pinching action quickly destroys the rope — especially when it's overloaded. The victim shown here was knocked out in just 1½ hours of service.

E. Apparent suicide: This rope jumped out of sheave and was soon destroyed by pulling around the shaft. Actually it was a case of sudden slack which threw the rope out of the sheave.

F. End of the line came quickly for this rope as the result of operating over a sheave that did not turn. Note the exceptionally heavy abrasion on one side of the rope. Sheaves should be checked thoroughly and often.

G. Victim of the "bends": Excessive bending of wire rope accelerates wear. Generally, more flexible ropes are used as bending stresses increase (with decrease in tread diameter of sheave or drum). If a rope is operated on a sheave too small for its bending characteristics, early failure is certain. Through an exhaustive series of bending tests, Union Wire Rope engineers have compiled data that you can use to assure getting the rope construction that will give you the longest service life. Ask about it.

H. On the "blink" from a kink: This open kink resulted from mishandling of rope. Guard against kinks by proper winding on the drum. Never pull a loop smaller. Always enlarge it, then straighten out the rope.

I.-L. Crushed and worn from "beatings on the drum": Even under normal operating conditions, drum wear gives wire rope severe punishment. This wear concentrates at the cross-over points and at the flange. Excessive drum crushing results from operating on small drums, excessive loading and poor winding. Smooth drums are not recommended. Here are typical "drum beatings":

I. Cross-over wear.
J. Cross-over crushing on drum.
K. Drum crushing from poor winding.
L. Drum-crushing from small drum.

Although drum wear cannot be eliminated, its effects can be greatly reduced. Under properly engineered procedures, two and three times the service can be obtained from the same line by improving drum conditions. Union Wire Rope engineers will help you with this problem. Get in touch with us for more information.

Tips

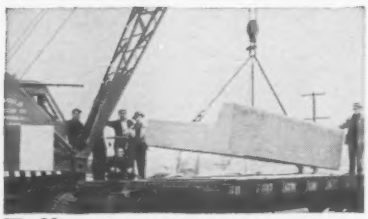
Be Sure You Use BALANCED Wire Rope

You hear a lot about extra strength in wire rope. There is no trick to designing wire rope with very high strength. But — there is nothing to be gained if high strength is put in to the exclusion or subordination of other qualities that are just as important as excessive strength.

For example: the life of a dragline depends on its resistance to abrasion. When it breaks, as a result of continued exceptionally hard digging in abrasive materials, the owner finds maintenance cost of the dragline increasing. Hard-drawn rope tends to act as a spring. As wear progresses, it arches over the crown of the strand. Repeated flexing of this too-strong arched wire causes early failure. So the drag rope must meet a condition where strength is not the major factor in resisting abrasion.

Every one of the Tuffy Special Purpose Ropes has a different ratio of strength to other properties necessary for longest life, most efficient operation and lowest maintenance expense. Your Union Wire Rope distributor has the BALANCED rope for every application.

Tuffy Special-Purpose Ropes are tailored & BALANCED for special uses

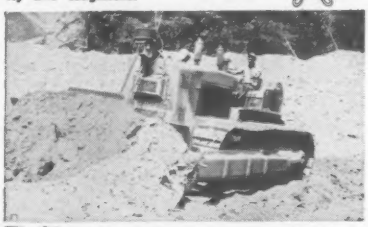


Tuffy BALANCED Slings & Hoist Lines

Top-performing team in every type of materials handling. Tuffy Slings are made of a patented, machine-braided fabric; stays extra flexible, can't be seriously hurt by knotting or kinking. Tuffy Hoist Line is a special construction of super flexibility and toughness.

Tuffy BALANCED Scraper Rope

It's flexible enough to withstand sharp bends, yet stiff enough to resist looping and kinking when slack. Moves more yardage per foot because it's specially built and balanced to take the beating of drum-crushing abuse.



Tuffy BALANCED Dozer Rope

Built to give you longer service with less downtime. 150' reels of 1/2" or 9/16" mounted on your dozers allow you to cut off worn sections without wasting good rope. Put Tuffy Dozer Rope on the job and watch costs go down!

Tuffy BALANCED Dragline Rope

Made to give you maximum abrasive resistance with super flexibility. Rides smoothly on grooves; hugs the drum when casting for full load. Consistently dependable in handling any material — wet or dry dirt, sand, gravel, rock, cement or minerals.

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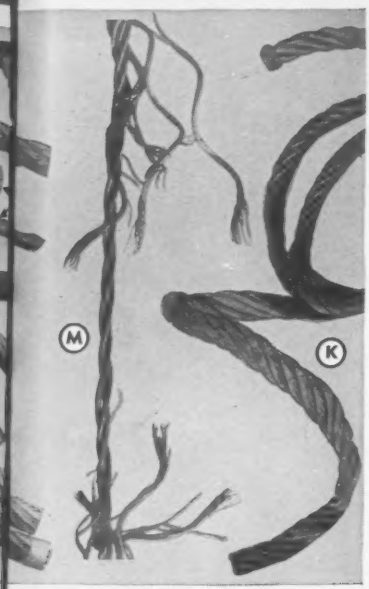

M. Overloaded — soon exploded: The rated capacity of a wire rope is based on the breaking strength (catalog) divided by a safety factor applicable to the type of service or use. The grade of steel, type of construction and size of the rope determine tensile strength. It must be properly related to the loads it will carry, or costly and dangerous early failures are likely to occur.

How Your Tuffy Distributor Can Help You Save Money

Condition of equipment is a big factor in longer rope life and greater economy. Your Tuffy distributor will help you check your equipment and operating conditions to make sure everything is in your favor for getting greatest service from your wire rope. Get in touch with him. And ask him to put your name on his mailing list for FREE Tuffy Educational Bulletins.

Your men, your equipment...wherever they go Hartford protection goes with them

Your jobs can take your men almost anywhere. To the next county . . . a distant state . . . even another land. *And where those men and your equipment go, your protection can go, too.*

You cannot buy more complete coverage than the Hartford offers. Or get it more easily than through a Hartford Group Agent or your insurance broker. The organization they represent can insure you against virtually all risks of property loss, cover your legal liabilities and serve all your bonding requirements.

If trouble comes. No matter where a problem situation may develop, Hartford is set up to give you fast, competent help. For we maintain more than 200 Claim Offices and 64 Engineering Department Offices strategically located from coast to coast. Trained personnel—underwriting experts, claimsmen, auditors and engineers—are at every point ready to go into action at your call.

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Northwestern Fire and Marine Insurance Company
Twin City Fire Insurance Company, *Minneapolis 2, Minnesota*

Tall Heavy Columns Carry Long Spans

Work advances on the new 20 story Crown Zellerbach headquarters, "San Francisco's most exciting building"

OFFICE TOWER'S glass curtain walls, above open ground level, frame the enclosed utility tower of San Francisco's new Crown Zellerbach building.

These features make it "exciting":

- **Tower provides 225,000 sq ft of office space, but covers only one-third of wedge shaped site.**
- **Ground level is open except for glassed-in lobby.**
- **Only two rows of columns, 63 ft apart, support the tower.**
- **Columns rank among the heaviest ever, weighing 2,500 lb per ft for the first 67 ft.**

The long-span column arrangement results from a desire by the management of Crown Zellerbach Corp.—one of the world's leading pulp and paper companies—to have complete flexibility in its new headquarters building. The open-area site layout stems from two CZ management objectives: to have an outstanding building and to lead the way in opening up and modernizing downtown San Francisco. Obviously, both of these objectives resulted in extra first cost. But both are being achieved with outstanding success and should easily compensate for the additional expense.

Early in the planning stages, Crown Zellerbach and the designers of the project analyzed the possibility of providing the needed additional space by constructing an addition to the building that now serves as CZ headquarters. They were forced to the conclusion that no matter how advanced the design of a new wing, the existing structure would limit future use flexibility of the combined structures. Result was a completely new site along with a new structure.

In order to make financing simpler, the new building is larger than needed for CZ operations. About half of the building will be leased out.

• **Modular design**—To achieve maximum flexibility and to obtain minimum future obsolescence, the designers adopted a completely modular concept in addition to the clear-span layout. Thus, each office floor is divided into 5½ ft modules. And each module is complete unto itself insofar as air-conditioning supply and return vents and lighting are concerned. With a cellular steel deck used for most of the building, services can be provided at any spot. And the ceiling is a continuous plastered membrane covered with acoustical tile so that corridors and walls can be put

. . . Massive columns for a light design

FIRST STEEL COLUMN section for the superstructure was placed in January. At 2,500 lb per ft, this member weighed 23 tons.

in at any point—and at any future time. This modular system permits use of full-height, lightweight partitions and thus complete privacy in any of the office spaces.

Although classed as a 20 story building, the office tower actually has only 18 floors above the lobby (16 office floors plus a mechanical floor and a dining and personal service floor for building occupants). The service core is 16 ft higher than the office tower and does, in fact, contain 20 floors. Top floor of the office tower houses mechanical equipment plus some storage area. The 20 floors in the service core include a lobby mezzanine and a penthouse for elevator overrun equipment.

The garden level surrounding the building is actually one floor below the lobby level. The garden level corresponds to the utility core service level.

• **Thick foundation slab**—Below the garden level is a basement and subbasement covering almost the entire block. Most of this is used for garage space. Some of it houses mechanical equipment. And a portion has provision for a sizable electronic computer installation. Reason the underground space is available is that the designers chose to support the building on an 8 ft thick base slab on a firm clayey sand stratum 39 to 47 ft below street level; alternate would have been a slab-pile combination at a higher level (ENR Mar. 13, p. 55).

Two of the tower floors are concrete for accommodation of utility lines rather than concrete covered steel deck. They are the second, containing a cafeteria plus other services, and the top mechanical floor.

The top office floor, which will serve as an executive floor for Crown Zellerbach, is the only office floor that has permanent partitioning installed with the construction contract.

The utility tower includes elevators, stairways, toilet facilities, a conveyor that distributes mail to mailrooms on each floor from a central facility in the basement, and other similar installations.

The office tower will be encased in heat-absorbing glass and will have dark-blue colored glass spandrels. The utility tower will be encased in a glass mosaic tile with a blue tone.

Steel erection started in January and is expected to be completed in September. The foundation work has been under way for several months. Completion of the building is scheduled for April, 1959.

To save time in construction of the building, several major items were purchased in advance of award of a general contract so that they would be available when needed. Included were the steel frame, the steel decking, and the exterior glass. Other major items that were purchased separately by the owner include the automatic elevators and the centrifugal compressors for air conditioning.

• **Steel design**—From a structural design standpoint, the most important elements of the building are the lower-level columns in the office tower and the transverse girders that connect them at second-floor level. Reason is that there is no lateral restraint for the columns between the garden or service level and the second-floor girder level—a distance of 33 ft. And these nine bents must resist the entire lateral forces of the office tower building.

It is fairly obvious that some of the lateral forces in the office tower will be resisted by the much stiffer service-tower portion. However, because the service core is offset from the office tower, the latter is—for the most part—designed as if it were an independent structure.

Two considerations govern lateral force design. One is the seismic loading provisions of the San Francisco Building Code that are based on dynamic analyses. The other consideration is, of course, wind load.

The building with its long-span design and lack of such inherently stiff members as partitions and deep spandrels might tend to be flexible. The designers figured that, for the comfort of the occupants, the story-to-story drift of the frame under a 20 psf wind load should be limited to $\frac{1}{8}$ in. And they further concluded that to protect the materials of construction from excessive earthquake damage, story-to-story frame drift should be limited to about $\frac{1}{4}$ in. for the 3½% gravity base shear. Result was a relatively stiff building frame.

Total weight of steel in the structure is in excess of 8,100 tons. This is equivalent to about 36 psf of floor area. It is interesting to note that the additional steel required for frame stiffness due to the long-span layout amounts to about 8 psf.

• **Heavy columns**—The heavy columns that rise 67½ ft through the second-floor level are 57x32 in. They are made up of a pair of 3 in. thick by 57 in. wide steel slabs held apart by three additional 3 in. thick slabs that are 25 in. wide

Translucent Stran-Lite sheets give natural interior light in the F & H Supply Co. building, Pensacola, Florida.

Stran-Steel Buildings . . .

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The building itself, used as a mill and industrial supply warehouse, is 80′ x 120′ including a 20′ front section for offices and a display room. Nailable Stran-Steel joists were used to support the office ceiling and make a strong floor for additional storage space above. Longer, wider *Stran-Satin* wall sheets combined with translucent *Stran-Lite* make a smart exterior.

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The column-free warehouse area has 100 percent usable space for storage, handling and loading facilities. A 6′ dock with canopy runs 100′ along the side of the building.

Stran-Steel Rigid Frame buildings can be tailored to the size, function and appearance you specify. Unobstructed interiors are ideal for factory, warehouse or retail outlet. You get a fire-safe building that goes up fast, is easy to insulate and heat, and needs little maintenance.

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A 20-ft. front section makes an attractive display room and office. Nailable steel joists in office ceiling support extra heavy storage above.

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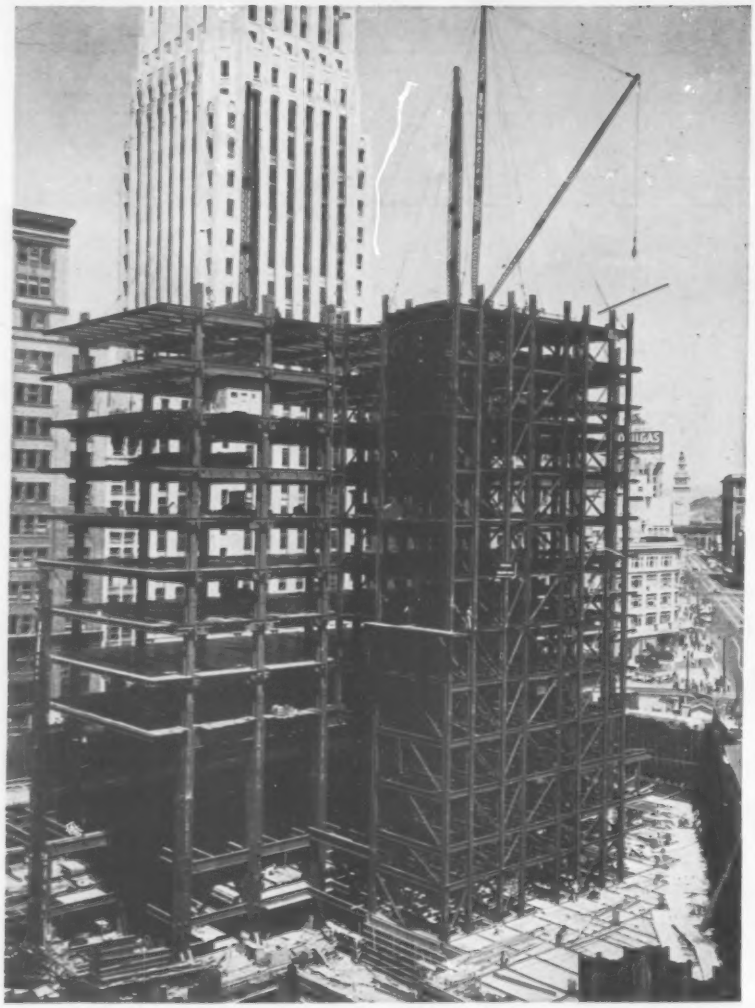
. . . Bolting cuts erection time



HALFWAY UP by the end of April, steel erection progressed two floors every four days. Bolted field connections speed the job.

(there is a ½ in. gap between interior and exterior slabs). One pair of the interior slabs is connected by a 22 in. wide, 2 in. thick steel plate (2¼ in. thick for corner columns). With two of the transverse slabs, this latter plate forms an H-section that is identical in exterior dimension with the columns rising above the second floor.

The heavy columns were fabricated at the Alameda works of Bethlehem Pacific Coast Steel Corp. The interior 2 in. slab was first welded by submerged arc to the two 3 in. transverse slabs that it connects. Then by use of 6x6x1 in. angles, this H section was riveted to the 57 in. wide, 3 in. thick cover slabs. Finally, the third 3 in. thick transverse slab was riveted into the member.

Connecting the heavy steel columns at second-floor level are 5 ft deep plate girders. These are made up of ½ in. thick web plates and 2¼ in. thick, 24 in. wide plates. Webs are stiffened by 4x3x⅜ in. angles that for the most part are on 4 ft centers. Some T-beams are used for diagonal stiffening. All stiffeners are welded to the web.

Above second-floor level, the floor-to-floor height is 13 ft 8 in. Transverse girders are 3½ ft deep and ceiling height is 9 ft.

• **Welded plate columns**—To achieve the necessary column stiffness above the second floor, an H section was developed, made of three plates welded together to provide 25x28 in. in over-all dimension. These sections, which mate with the H section on the interior of the lower-tier columns, have flanges varying from 1½ to 3 in. thick and webs from 1 to 2½ in. thick.

Frame drift transversely is due not only to bending in the columns, but also to rotation of the long-span 42 in. deep plate girders. Above the twelfth floor, girders designed to support gravity loads provide the necessary stiffness. Below this level, due to increasing lateral shear, the girder rotation is limited by increasing its moment of inertia. Thus, a lower-level interior plate girder has 24 in. wide flanges up to 1¾ in. thick, whereas upper-level girders have flanges only ⅞ in. thick. All webs for interior girders are ⅞ in. thick. Nominal web stiffening is required.

End girders above the second floor are slightly heavier due to cantilever overhang of the floors. Webs are ⅞ in. thick and flanges—still only 24 in. wide—are up to 2¼ in. thick.

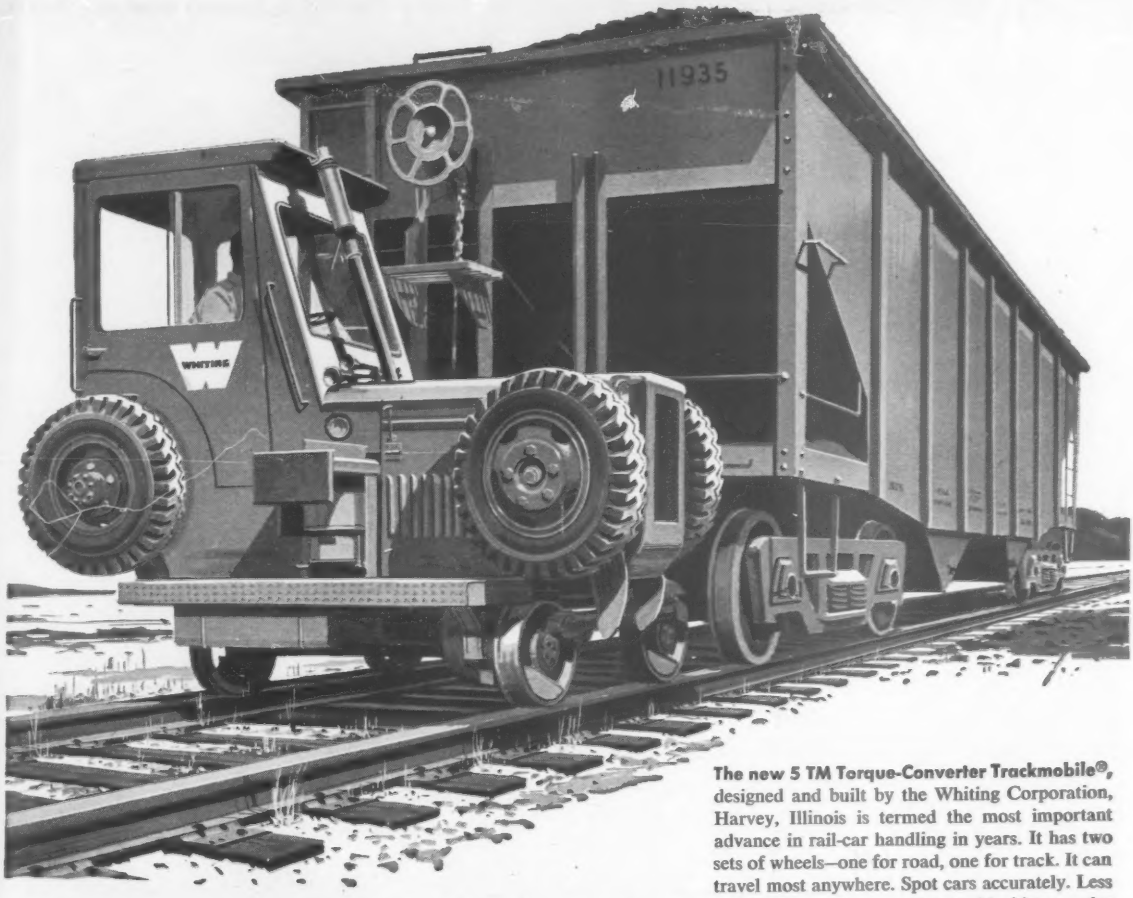
Ordering steel before designs were finalized resulted in some complications. For example, as utility designs were developed, it became obvious that more and more holes had to be cut through girders. These holes made the girders literally look like "Swiss cheese." To make the previously ordered web plates serve, edge stiffening around the holes was resorted to. Had the number of holes been known before the steel order was placed, it is probable that thicker webs would have been used for some girders and less edge stiffening would have been needed.

• **Bolted joints**—All field connections in the steel structure are bolted with high-strength bolts for primary connections and machine bolts for secondary connections. Some of the connections were simplified due to the fact that 1¼ in. dia high-strength bolts could be used. During the design period, manufacturers developed a satisfactory impact wrench capable of tightening such large-diameter bolts.

The column-girder connections above the second floor provide a good example of the bolted joints. Connections for top and bottom flanges of the girders are cut from pieces of 36 WF 300. The use of 1¼ in. bolts in shear in these top and bottom connections instead of smaller bolts allows two T's to be cut from one beam section.

In this joint, the top-flange connection is bolted to the column in the shop using six 1¼ in. high-strength bolts. The bottom connection, on the other hand, is shop riveted to the column. Reason is that the end moment due to dead load on the girder results in tension in the top connection and compression in the bottom. Lateral forces can superimpose either tension or compression on the top or bottom connection. At the bottom, the tension counterbalances the dead-load compression. But on the top connection, the tensions are additive. And since high-strength bolts are better tension connectors than are rivets, the top connection is bolted with

Ingenious Whiting Trackmobile uses **Allison Torqmatic Drive**



The new 5 TM Torque-Converter Trackmobile®, designed and built by the Whiting Corporation, Harvey, Illinois is termed the most important advance in rail-car handling in years. It has two sets of wheels—one for road, one for track. It can travel most anywhere. Spot cars accurately. Less waiting for work crews. Patented jacking coupler shifts freight car's weight to Trackmobile's wheels for needed traction. Allison TORQMATIC DRIVE provides smooth fluid power needed for moving many times Trackmobile's weight.

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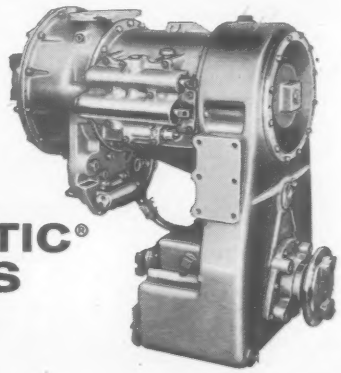

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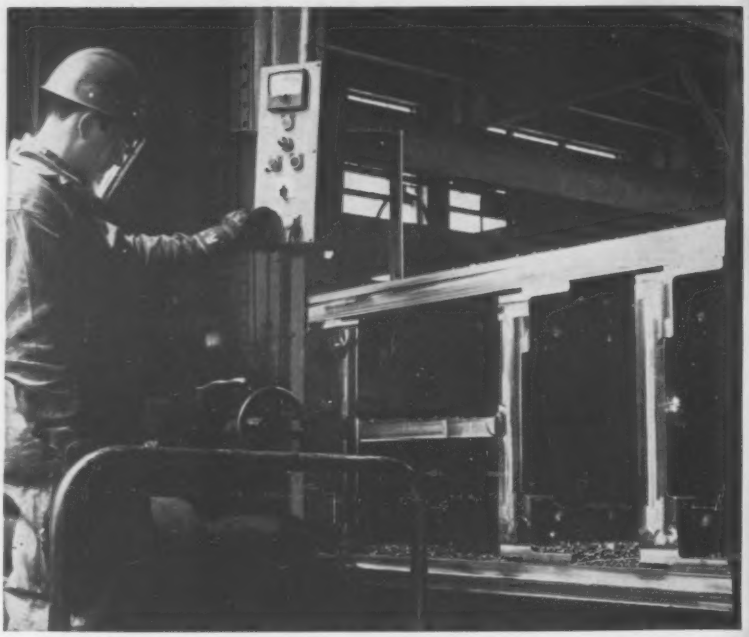


COLUMN being milled in shop has 3 x 57 in. flanges. The three webs, connected by 6x6x1 in. angles, are 3x25 in. each. Interior plate between webs made a shape that matches exactly the columns used above the second deck.

1¾ in. dia bolts rather than riveted.

Spandrel girders in the longitudinal direction were limited to a relatively shallow depth of 3 ft for architectural reasons. Spandrels of this depth are more than adequate for structural requirements for the lateral forces involved. But to limit drift under earthquake loads, the moment of inertia of the girders was increased in many instances.

Floorbeams between transverse girders are on 7 ft centers and are—for the most part—16 WF 36 members. These beams are sized for 100 psf floor loading due to possible use of electronic computers. Design floor load for main girders and columns is 50 psf.

To achieve greater length in the office area, the floor cantilevers some 12 ft beyond the last bent on each end. Because of the limitations of the cellular deck, it was not possible to tie the top flange of the cantilever beam across the top flange of the plate girder. So the top-flange stress was carried through angles connected to the web with bolts through the girder flange. Bolts to the flange are spaced to fit between the cellular deck with special-size washers at the top giving additional clearance.

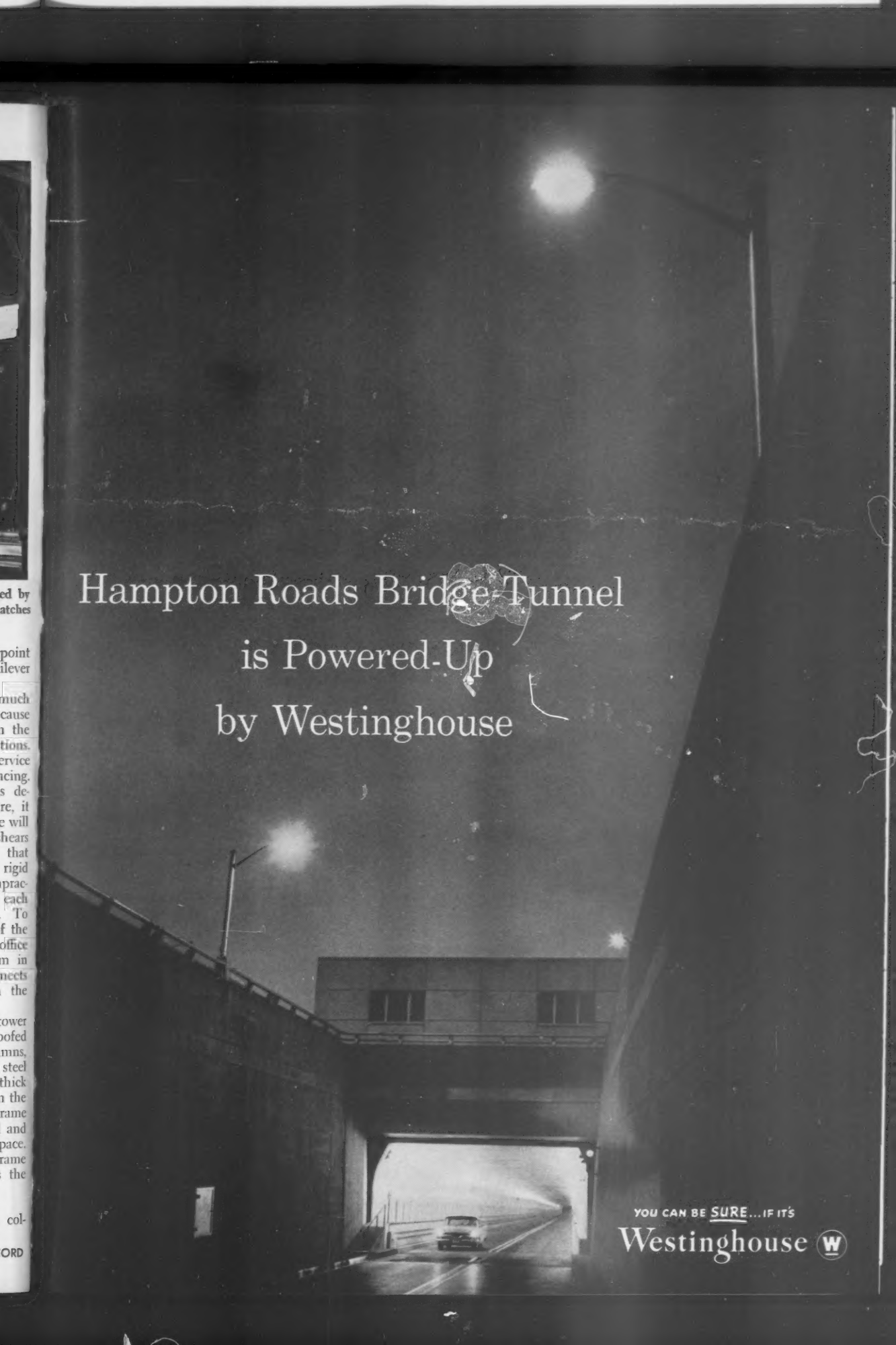
The beams are bolstered by 16 in. WF members at the bottom to reduce the number of bolts required at the girder flange. This also increases the moment of inertia for 5 ft each side of the girder, resulting in decreasing deflection due to greater depth at point of maximum moment of the cantilever arm.

Design of the service tower was much simpler than the office tower, because it includes solid concrete walls on the exterior and in many interior locations. Thus, the steel framework of the service core has considerable diagonal bracing.

Although the office tower was designed as an independent structure, it was recognized that the service core will absorb, to some degree, lateral shears from the office tower. Reason is that the service core is naturally more rigid than the office tower and it was impractical to design bracing systems of each element to be of equal stiffness. To unite the vertical bracing system of the service core with the frame of the office tower, a horizontal bracing system in each floor of the office tower connects the heavy transverse girders with the service core bracing system.

Structural frame for the office tower above the second floor is fireproofed with vermiculite plaster on columns, girders and beams. The cellular steel deck is fireproofed with a ½ in. thick layer of acoustical plaster sprayed on the underside. Fireproofing of the frame precedes installation of mechanical and electrical ducts in the ceiling space. Below the second-floor level, the frame is fireproofed with concrete, as is the entire service core frame.

• **Steel erection**—The heavy steel col-


Hampton Roads Bridge-Tunnel
is Powered-Up
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YOU CAN BE SURE...IF IT'S
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Hampton Roads Bridge-Tunnel Links Virginia Peninsula with Norfolk

Westinghouse Electrical Equipment is Used Throughout

The bridge-tunnel recently opened across Hampton Roads, between Newport News and Norfolk, Virginia, features many "firsts" in engineering and construction. Among the most interesting of these are the specially engineered uses of electrical power for illumination, ventilation and other required services.

Both bridge and land approaches to the new 7,479-foot portal-to-portal tunnel are lighted with Westinghouse OV-20 mercury vapor luminaires, controlled from the central control panel. The interior of the tunnel is lighted with special Westinghouse fluorescent luminaires—employing enough fluorescent tubes to provide a single uninterrupted light line three miles long. Double rows of these fixtures provide high-intensity lighting at the tunnel portals, while the central portion of the tunnel uses a single row of lights on each side. Lighting intensities at both tunnel openings are controlled in relation to the daylight or darkness outside, so no abrupt visual adjustments to varying light conditions are required when entering or leaving tunnel. Special Westinghouse saturable reactors and controls were developed to provide this important lighting technique. The entire length of tunnel is so well illuminated that motorists will be able to switch off their lights while driving through it.

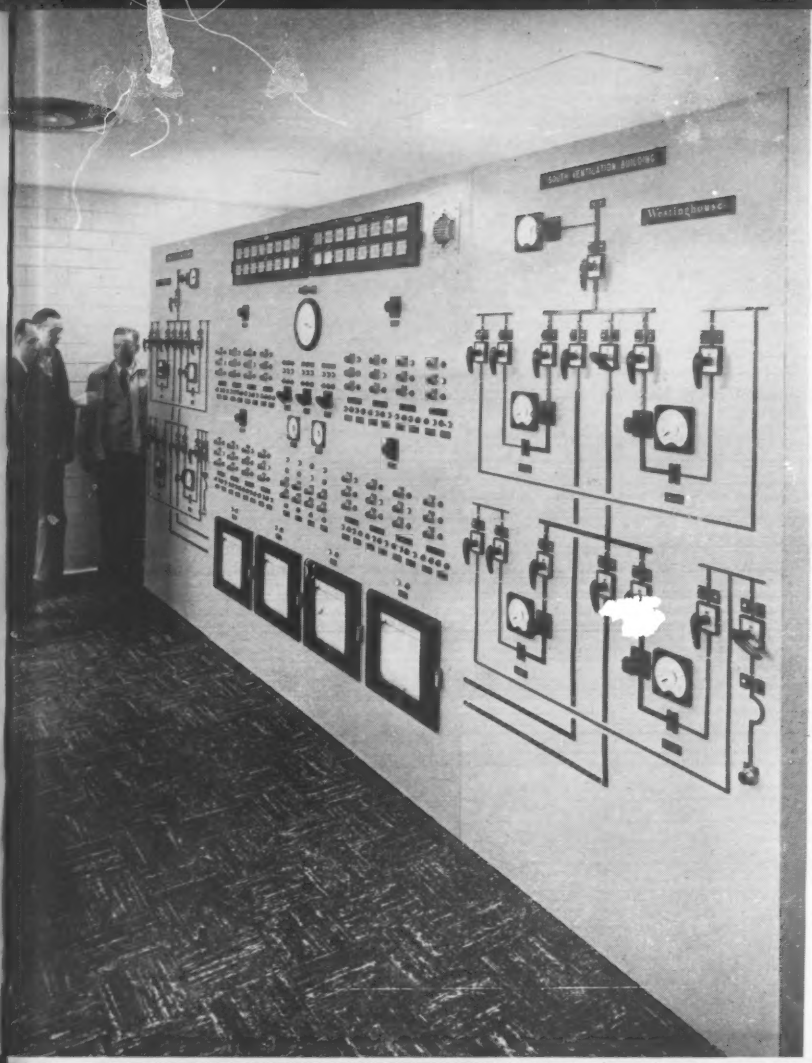
Special Westinghouse equipment controls sixteen vane-axial ventilating fans, eight at each end of tunnel, with a total circulating capacity of 3,408,000 cubic feet of air per minute. Eight fans supply fresh air to tunnel while the other eight exhaust contaminated air. Pitch of fan blades is variable and remotely controlled to permit accurate regulation of air volume handled by each fan. All fan operation is coordinated and controlled at central control board where four carbon monoxide recorders provide a constant check on the concentration of this gas throughout entire length of tunnel.

The entire electrical power requirement of tunnel

(cont'd)

Tunnel is lighted with special Westinghouse fluorescent luminaires installed in protective tubes of pyrex glass. Special bronze fixtures were provided by Westinghouse to mount lights and protective tubes and to facilitate cleaning and replacement.

Intensities of tunnel lighting are varied by means of saturable reactors. Also included in installation are lighting supply transformers and constant current regulators to control bridge and approach lighting. View of transformer room shows John L. Taylor of E. C. Ernst, Inc., Electrical Subcontractors and Engineers, and William G. Phillips, Westinghouse Service Engineer. J-94089



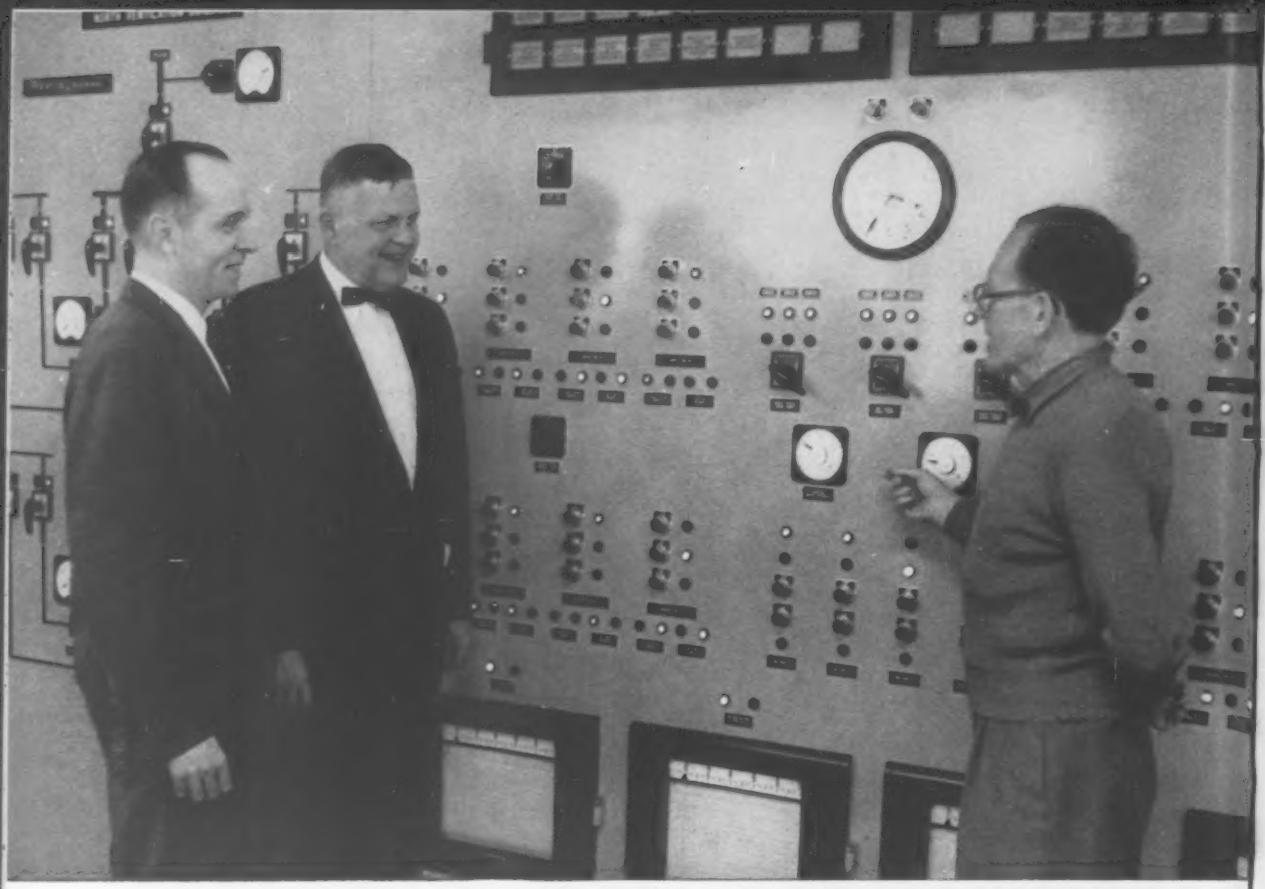
A Westinghouse special master tunnel control board allows operator to supervise tunnel operation from central point. Both tunnel illumination and ventilation are controlled from this board. Ventilating rates can be adjusted by varying number of supply and exhaust fans in operation and by changing fan speed and blade pitch to increase or decrease fan capacities. Also incorporated are alarm indicators, carbon monoxide recorders, time switches and other indicating and control devices. M. B. Trimble, Westinghouse Construction Sales Engineer; James McMahan, Bridge-Tunnel Superintendent, Virginia Department of Highways; and Harry D. Mahoney, Engineer, Parsons, Brinckerhoff, Hall and Macdonald, Consulting Engineers, discuss control board.

Westinghouse double-ended power centers utilize 1000-kva Inerteen®-immersed power transformers. Incoming power service enters metal-clad switchgear located between step-down transformers. Close-coupled to transformer secondaries are low-voltage switchgear assemblies, special fan control cubicles and control centers for tunnel auxiliaries.

J-94089

YOU CAN BE SURE...IF IT'S

Westinghouse



Close-up of center of tunnel control board shows M. B. Trimble, Westinghouse Construction Sales Engineer, with Maurice N. Quade and J. O. Bickel of Parsons, Brinckerhoff, Hall and Macdonald, Consulting Engineers, Designers and Supervisors.

is supplied through four identical Westinghouse 2000-kva power centers, two in each ventilation building on man-made islands at each end of tunnel.

This is another example of how Westinghouse can help engineers and contractors satisfy electrical distribution requirements. For information applying to your specific needs, see your Westinghouse electrical construction engineer. Westinghouse Electric Corporation, Box 868, Pittsburgh 30, Pa.

J-94089

YOU CAN BE SURE...IF IT'S Westinghouse

Bridge approach to south end of Hampton Roads Tunnel. Illumination for both approaches is provided by Westinghouse OV-20 mercury vapor luminaires controlled by time switches and photoelectric relays.

Owner: Commonwealth of Virginia—Department of Highways

Consulting Engineers: Parsons, Brinckerhoff, Hall and Macdonald

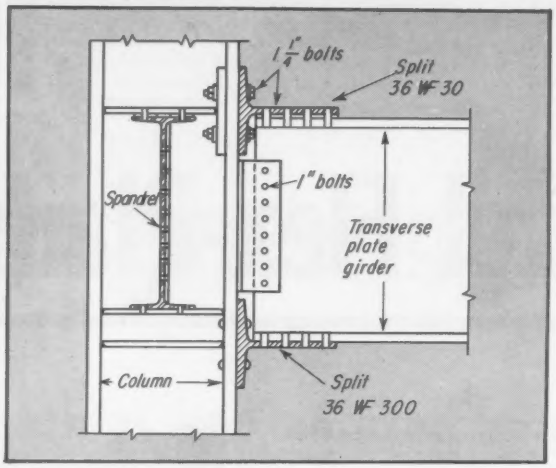
General Contractors: Merritt-Chapman & Scott Corp.
(Approach bridges, portal islands, cut-and-cover sections, underwater tunnel)

Tidewater Construction Corp.
(Portal approaches, ventilation buildings, mechanical and electrical work)

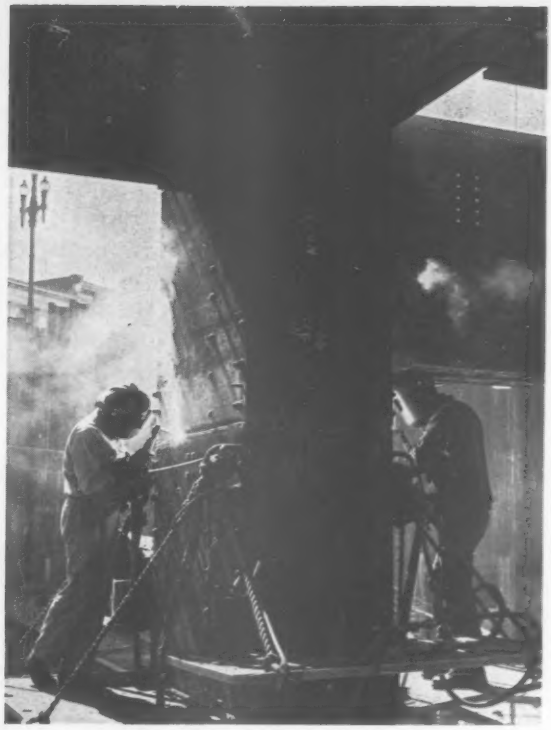
Electrical Subcontractors: E. C. Ernst, Inc.

Over 250 Pages Westinghouse Data in Sweet's Construction File.

. . . Tricky design for bolted connections



CONNECTION of plate girder to column utilizes high strength bolts and split 36WF300.



COLUMN BUTT SPLICES each consumed 120 lb of weld metal and required 17 man-hours to complete.

umns were erected in three sections, maximum lift being 32 tons. The heaviest plate girders weighed 15 tons. Bethlehem Pacific used a 45 ton guy derrick to erect the lower-level lifts.

The columns are spliced with butt welds. Each splice weld requires about 120 lb of weld metal and 17 man-hours of welding.

Steel was trucked to the site from Bethlehem's Alameda fabricating shops as needed. The trucks drove down an earth ramp to deliver lower-level steel. Then wood ramps were constructed on top of the steel frame of the garage. This permitted steel deliveries to be made directly under the 20 ton guy derricks that are erecting the office tower and the 15 ton guy derrick directing the service core tower. And it permitted direct delivery of concrete and other materials.

With these erection facilities, the steel framework has risen quickly. Once the first few floors were in, the frame went up at the rate of two floors each four days. According to Bethlehem Pacific officials, use of high strength bolts contributed to a remarkable degree to the erection speed of 150 tons in place per working day.

• **Air conditioning**—Because the building is completely air conditioned the glass exterior of the building is permanently fixed. Each 5 ft 6 in. module has individual air supply and exhaust.

For cooling, a chilled-water system is used, with 900 tons of refrigeration. Compressors and heavy equipment are in the basement. Fans and air-handling machinery is located on the top floor.

Perimeter air-handling units are of the induction type. Interior-zone air is delivered from slots at the ends of the lighting fixtures.

The system has automatic control started from a centralized IBM time clock. But each office space or group of spaces is capable of individual control. Control of exterior zones is obviously more difficult than interior because of the sun problem, even though heat-resisting glass is used. In practice, interior zones usually will be controlled as a unit rather than by individual areas.

Air-conditioning supply ducts are located in the ceiling. The entire 4 ft section between the floor and the ceiling is used as a return plenum. This has the advantage of reducing ductwork. But it also means that such loads as heat from the ballast of fluorescent lighting is picked up by the return air and does not affect the room load.

WHEN COMPLETED, the landscaped site will feature a circular restaurant.

• **Credits**—The entire project is under the supervision of Fred D. Helversen, chief of industrial engineering for Crown Zellerbach Corp. Associated architects on the project are Hertzka & Knowles and Skidmore, Owings & Merrill, with John B. Rodgers of SOM as project director and in direct charge of architectural design and working drawings. Alexander Boome of SOM was in charge of mechanical and electrical design. Wayne Hertzka of Hertzka & Knowles is in charge of construction supervision.

Structural design was by the engineering office of H. J. Brunnier.

Bethlehem Pacific Coast Steel Corp. is handling steel fabrication and erection under the supervision of M. H. Frincke, manager of steel erection.

General contractors are Haas and Haynie, with A. G. Johnson superintendent.

Heltzel Flex-Plane

UNITIZED BATCHING PLANTS to further speed set-up and dismantling time . . . to give you even greater on-the-job flexibility. The new Heltzel Unitized Plant—like these on a G. Toccalino & Son job in Detroit—is designed in three easy-to-handle sections that go together in minutes. This installation is set up as push-button drive-through for extra fast service. Batcher and scale unit is integral part of center section . . . a real time-saving innovation. (Note new Heltzel E-4 twin-batcher cement plant.)

2202

THE HELTZEL STEEL FORM AND IRON

FLEX-PLANE COMBINATION FINISHER-FLOAT does two jobs in one, reducing crew time to an absolute minimum. The combining of these two jobs is a natural—results in a better finish in faster time. This new machine was thoroughly tested on several jobs last season. Contractors report 4000 feet of 24-foot pavement was floated and finished in a normal day with but two or three hand finishers required. Get the facts on this profit maker before submitting too many quotations.

ne Engineering

brings you unitized batching, improved forms and a new way to finish concrete

Modern highway design demands top efficiency in highway construction machinery. Portable . . . versatile . . . automatic . . . *fast*.

That's why Heltzel Flex-Plane Engineering works to give you the most modern road-building equipment obtainable. Up-to-date engineering, for example, has produced a definite contractors' preference for Flex-Plane over all other makes. This preference is based, of course, on proved performance.

Find out now what Heltzel Flex-Plane Engineering can mean to you — call on actual users of Heltzel and Flex-Plane equipment, and prove to your own satisfaction that this is the *modern* equipment for modern highway construction.

HELTZEL DUAL DUTY FORMS, such as those shown in use on the Plattsburg SAC base, have been redesigned to assure fast setting and stripping with maximum strength-weight ratio. Sizes available to exactly suit your job requirements.

IRON **COMPANY • Warren, Ohio**

Traveling Pugmill processes materials for . . .

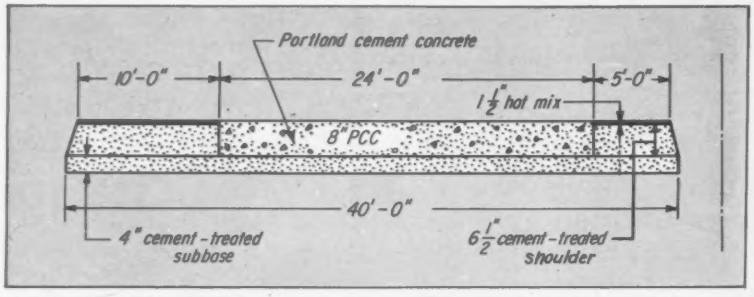
Colorado's Smoothest Concrete Pavement

In the first project of its kind, a traveling-form paver operating on cement-treated subbase has been used to place concrete pavement for a Colorado Interstate System highway. Subsequent tests by the Bureau of Public Roads' roughometer showed the concrete pavement to be the smoothest ever placed in Colorado.

It had a roughometer rating of 80 in. per mile, compared with an average rating of 100 for other concrete highways in Colorado.

When the 8 mi job is completed this spring, U. S. Highway 85 will be a four-lane divided highway for a 15 mi stretch between Denver and Castle Rock. The new pavement will serve as the southbound trafficway. A wide median strip separates it from the existing two-lane road, which will carry northbound traffic.

The major portion of the job is an 8 in. plain concrete pavement placed on 4 in. cement-treated subbase 40 ft wide. The two-lane concrete pavement is 24 ft wide. Cement-treated shoulders were built 10 ft wide along the outer lane and 5 ft wide along the inside.



CONSTRUCTION DETAIL shows portland cement concrete roadway and bituminous shoulders resting on accurately graded, cement-treated subbase.

• **Subbase construction**—The primary purpose of the cement treatment was to provide a smooth, stable base for the traveling-form paver. The contractors had the option of using imported granular materials meeting state specifications for subbase, or using substandard materials located nearby and treating them with enough cement to produce sufficient stability as determined by stabilometer tests.

They chose the more economical method of cement-treating the nearby borrow material instead of importing it.

Tests on materials from several nearby pits indicated that 2% portland cement by weight would provide the required stability. Average haul for borrow material used in the construction was 4 miles.

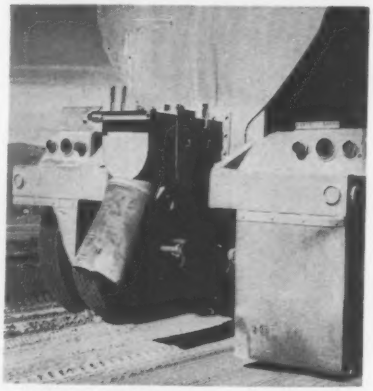
The subbase material was spread on the subgrade in four windrows 10 ft apart. A 125 bbl cement tanker with auger dispenser placed the required 2% of cement on each windrow.

A traveling road-mixer, moving about 20 fpm, then picked up each

(*Story continued on page 52*)

SUBBASE BORROW MATERIAL was blended to improve gradation and loaded into 10 ton sideboard trucks to be shuttled to road site.

WINDROW OF SUBBASE MATERIAL is placed on subgrade to await processing.



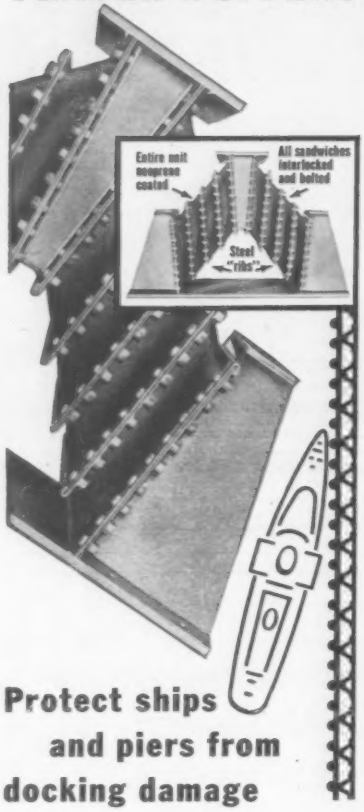
AUGER DISPENSER on cement tanker adds 2% cement by weight to windrows.

MOTOR GRADER blades windrows to blend materials and level subbase. Compaction of the cement-treated materials was accomplished by rubber-tired rollers.

WIRE set at pavement-top level and guide on grader blade permit exact grading of shoulder material.

TRACTOR DRAWN SUBGRADER, with its tracks riding on leveled material, clips center of subbase to exact grade.

RUGGED RAYKIN FENDER BUFFERS



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Here's a wonderfully-efficient dock fendering system, easy to install and inexpensive to maintain. Consisting of V-type arrangements of special rubber slabs bonded to tough steel plates, General's Raykin Buffers can be supplied, tailor-made, with deflection from 3" to 18" and energy absorption from 5,000 to 104,000 ft-lbs. Unaffected by corrosion, rotting, or aging, Raykin Buffers give positive, all-angle protection for harbor installations. Send the coupon for more information.

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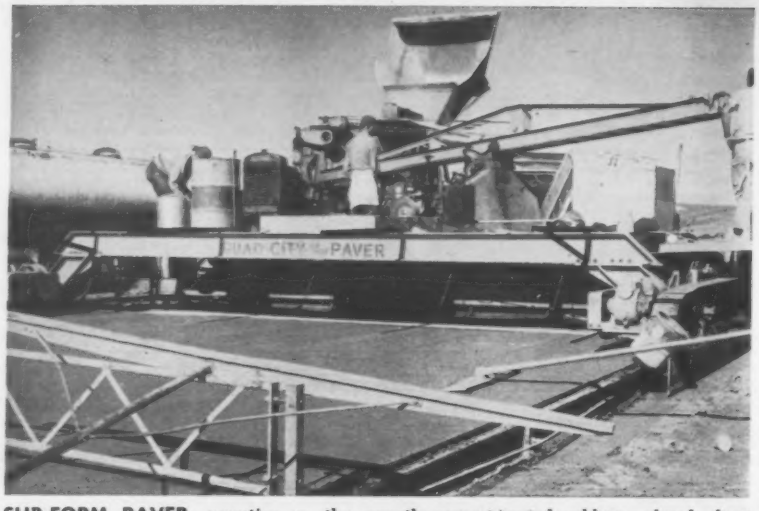
. . . Paver places concrete pavement



SLIP-FORM PAVER operating on the smooth cement-treated subbase, placed about 1,600 ft of 24 ft wide pavement in an average day's work.

CONTRACTION JOINTS were sawed longitudinally along the center line of the pavement. Transverse joints were cut at 20 ft intervals.

windrow, mixed the soil and cement with water, and left the cement-treated material in a windrow behind the mixer.

The first two windrows—one-half the roadway—were leveled with a motor grader while the other two were being mixed. When the entire 40 ft width had been spread and was being compacted with rubber-tire rollers, "blue tops" (grade stakes) were set 2 ft outside the proposed pavement edge, at 25 ft c-c. Steel stakes were driven near the blue tops and a string line was place 8 in. above the blue tops to serve as a guide for clipping the subbase to exact grade.

A wire indicator attached to the blade of the grader exactly 8 in. above the cutting edge enabled the operator to clip the section accurately by keeping the indicator on the string line. After the outer edges of the subbase were cut to grade, they formed a true plane for the subgrader which clipped the center portion. Final rolling was done with a three-wheel roller. This provided an excellent surface for operating the concrete paving equipment.

• **Concrete pavement**—Concrete for the pavement was mixed in a 34E mixer and placed on the cement-treated subbase by a traveling-form or slip-form paver. The average daily production was about 1,600 ft of 24 ft wide pavement.

Specifications required 28 day minimum strength of 3,000 psi; 4% to 5½% of entrained air; and a 2 in. maximum slump. Actual strengths obtained on the six-bag mix were 4,500 psi. Maximum aggregate size was 2 in.

(Story continued on page 54)

Over 1,500,000 square feet of

PRECAST ROOF CHANNELS "GO TO MARKET"

Only a small part of the huge Farmers Market at Forest Park, Ga., is visible in this photo of a typical farmers' shed. Altogether, the 140-acre Market comprises 32 sheds, 9 dealer buildings, an administration building, and numerous miscellaneous buildings.

Pouring precast reinforced concrete roof channels at job site. A total of 14,783 such channels—ranging in size from 4′ x 20′ to 4′ x 46′ with 8″ to 16″ flanges—and 15,325 tons of precast structural framing, were used in the Market.

● Almost 15,000 precast concrete roof channels went into the buildings for this new 140-acre Farmers Market near Atlanta. In addition, over 15,000 tons of precast concrete members were used in structural framing.

Precast concrete was chosen for its speed and economy in construction, its low maintenance costs, and because it gave the owners a permanent, fireproof market.

In the manufacture of the precast members, Lehigh Early Strength Cement was used to save time and money. Form costs were cut 50%, labor costs 25%, and production time by 50%.

This is another example of the advantages of Lehigh Early Strength Cement in modern concrete construction.

Owner: Georgia Farmers Market Authority, Atlanta, Georgia
Architect: Abreu & Robeson, Inc., Atlanta, Georgia
Engineers: T. Z. Chastain, Atlanta, Georgia
Contractor: Thompson & Street Company, Atlanta, Georgia

LEHIGH PORTLAND CEMENT COMPANY

Allentown, Pa.

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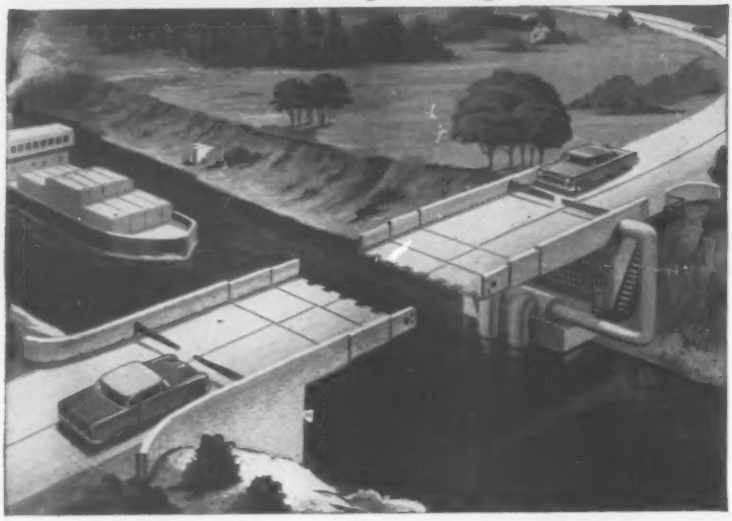
MARS outstanding design **SERIES**



automated bridge

The bridge of tomorrow will be self-activating, equipped with electric-eye controls and an anti-freeze system. No overhead structures will obstruct the view, or interfere with radio reception, according to Robert J. Companik of Chicago.

In his design, the bridge is operated by pressure pumps that draw water from the canal into the hollow structure and hold it shut by the weight of the water. To allow boats to pass, pressure is released, counterweights pull the sections together, and the bridge opens. An electric eye down the canal activates the opening and the bridge does not close until an eye on the other side is passed. Heating units keep both eyes free from snow and ice, and a brine system keeps the bridge in operation in freezing weather.

Many ingenious solutions to traffic and other problems are on the boards today. To make their ingenuity clear, and to translate them from idea into reality, requires the best of drafting tools.

In pencils, of course, that means Mars, long the standard of professionals. Some outstanding new products have recently been added to the famous line of Mars-Technico push-button holders and leads, Lumograph pencils, and Tradition-Aquarell painting pencils. These include the Mars Pocket-Technico for field use; the efficient Mars lead sharpener and "Draftsman" pencil sharpener with the adjustable point-length feature; Mars Lumochrom, the color-drafting pencils and leads that make color-coding possible; the new Mars Non-Print pencils and leads that "drop out" your notes and sketches when drawings are reproduced.

The 2886 Mars-Lumograph drawing pencil, 19 degrees, EXEXB to 9H. The 1001 Mars-Technico push-button lead holder. 1904 Mars-Lumograph imported leads, 18 degrees, EXB to 9H. Mars-Lumochrom color-drafting pencil, 24 colors.

J.S. STAEDTLER, INC.
HACKENSACK, NEW JERSEY

at all good engineering and drawing material suppliers

. . . Uses sawed joints

Contraction joints ⅛-in. wide were sawed transversely at 20 ft intervals, and longitudinally along the center line of the 24 ft pavement. These were sealed with a joint sealer. Construction joints were keyed and tied, and the completed pavement sprayed with a curing compound.

• **Shoulder construction**—Material for the shoulders was windrowed on the pavement and mixed with cement and water by the traveling pugmill used for subbase construction. The mixed material was then bladed on to the subbase, compacted and surfaced.

Final shoulder cross-section provided a 4 in. cement-treated subbase, 6¼ in. of cement-treated shoulder material, and a 1½ in. hot-mix bituminous surface.

• **Equipment**—The contractors used the following equipment in laying and processing the sub-base: Ten 10 ton dump trucks to haul borrow, and one spreader-box; two motor graders; three rollers; two 1,500 gal tank trucks and a gravity-spray water truck; a 125 bbl cement tanker; traveling mixer and spreader box; one shovel-tractor and a subgrader.

Other equipment included screening and loading equipment for the borrow material; a central batch plant for the concrete materials; dry-batch trucks; a concrete paver for mixing the concrete; the traveling-form or slip-form paver; concrete saw and curing-compound spray machine.

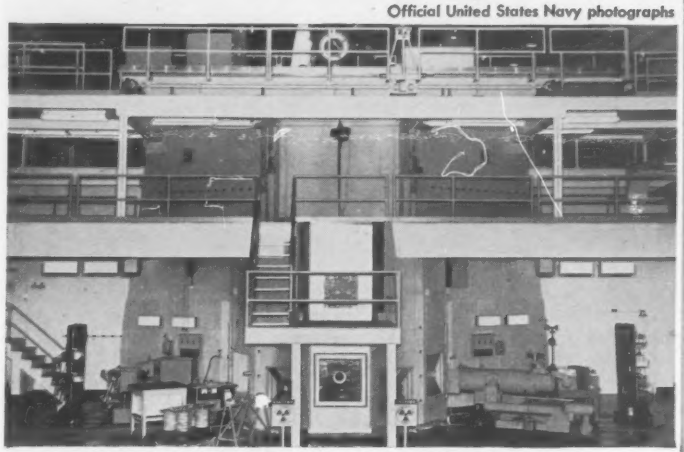
• **Experimental sections**—A number of experimental sections of pavement and subbase are being built this spring, as part of the project. There are three combinations: 8 in. reinforced concrete on 4 in. of cement-treated base; 8 in. plain concrete on a 20 in. cement-treated subbase, and 10 in. plain concrete on 4 in. of cement-treated subbase.

The 20 in. subbase thickness was derived on an economic basis. Construction estimates indicated that the cost of the 8 in. concrete pavement with wire mesh reinforcing and dowels, on 4 in. of cement-treated base would be about equal to the 8 in. plain concrete pavement on the 20 in. cement-treated subbase.

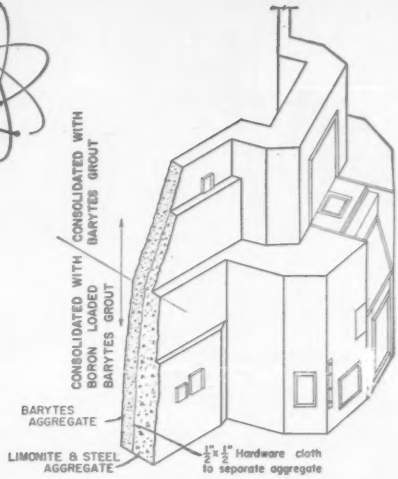
• **Joint venture**—Roberts Construction Co., Omaha, and Western Paving Co., Denver, are joint contractors on the project. Construction is under the supervision of Paul Morley, resident engineer, and Fred Stern, district construction engineer, of the Colorado State Highway Department.

unique Prepakt wall shields nuclear research at Naval Laboratory

Official United States Navy photographs



Prepakt high-density concrete shield forms one end of Naval Research Laboratory "swimming pool" reactor. Behind shield reactor core is immersed in pool 40 ft. by 26 ft., 20½ ft. deep. Besides assuring safety from harmful radiation, Prepakt methods eliminated water leakage problems usually associated with difficult placement of conventional concrete.

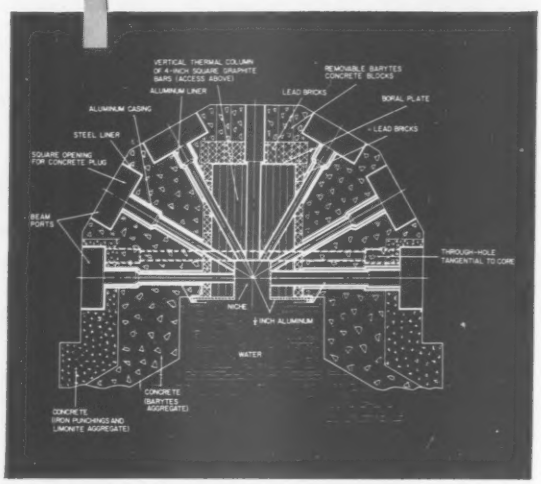

CONSOLIDATED WITH BARYTES GROUT
CONSOLIDATED WITH BORON LOADED BARYTES GROUT
BARYTES AGGREGATE
LIMONITE & STEEL AGGREGATE
½" x ½" Hardware cloth to separate aggregate

Prepakt concrete is made by consolidating preplaced aggregates with special grouts. For this concrete shield the aggregate nearest the core was barytes, for absorbing neutrons. Directly behind, a ½-inch mesh screen separates the barytes from a blended coarse aggregate consisting of limonite and steel punchings. This section was to stop gamma rays. All aggregates were precisely preplaced, then intruded simultaneously with a grout containing boron frits and barytes sand. When the grout level reached an elevation where less shielding was needed, the expensive boron frits was withdrawn from the mix and a straight barite grout used to complete the placement.

The Naval Research Laboratory Reactor in Washington, D. C. features one of the most unusual concrete biological shields ever constructed. According to specifications, the shield was to be composed of four different mixes of high-density concrete cast monolithically without cold joints. The complexity of mix design and the necessity for precise, uniform placement made it advisable to call in shielding concrete specialists. INTRUSION-PREPAKT was selected because its experience and unique methods were ideally suited to the project.

Safety, economy and operational effectiveness were all considered in designing this shield. It was desirable that it be as thin as possible to hold the length of beam ports to a minimum and thus intensify the neutron flux at the ports' outer ends. At the same time the shield must be dense and leak-free to assure personnel of complete safety. PREPAKT* high-density concrete provided the economical solution and met all conditions with an ease and sureness that goes hand-in-hand with experience.

Patented methods and materials in the hands of skilled personnel permit INTRUSION-PREPAKT to take jobs like this in stride. Tight schedules and difficult operating conditions are the rule rather than the exception. Whether your requirements are for high-density concrete or more conventional construction services, you will save time and money by calling INTRUSION-PREPAKT, INC., Room 568-0, Union Commerce Bldg., Cleveland 14, Ohio. European Division, Zurbaran 14, Madrid, Spain. In Canada, INTRUSION-PREPAKT, LTD., 159 Bay Street, Toronto, Ontario.



Horizontal cross section through Prepakt shield illustrates necessity for using concrete that assures complete embedment of beam ports and a tight bond to metal inserts.

INTRUSION-PREPAKT, INC.

OFFICES IN PRINCIPAL U. S. AND FOREIGN CITIES

*Intrusion and Prepakt are trade marks of Intrusion-Prepakt, Inc., whose methods and materials are covered by U. S. Patents Nos. 2313110, 2655004, 2434302 and others, also patents pending.

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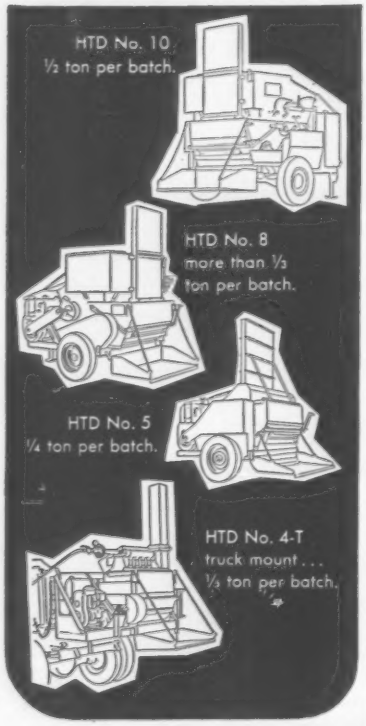

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New Look in Waste Treatment

Chemstrand's development of nylon waste process illustrates upcoming period of charting the unknown

Purdue University's annual industrial waste conference in Lafayette, Ind., early this month produced a classic example of the new look in industrial waste treatment.

Two researchers from Chemstrand Corp. described how the company moved over uncharted ground in developing a treatment process for wastes at its Pensacola, Fla., nylon plant. The development procedures that Chemstrand utilized illustrate the thoroughgoing approach to original development that will be required of a rapidly increasing number of industrial plants as the pressure for industrial pollution abatement mounts inexorably.

Completed in 1953, the Florida nylon plant was equipped originally with detention lagoons that stored wastes during low flow summer months and released them when the receiving body's assimilative capacity was sufficiently high. Soon thereafter, a decision was made to more than double plant production and the need for treatment of a waste that had never been treated before became apparent. Then followed a 2½ year research and development program, culminating late last year in construction of treatment facilities.

These consist of a submerged combustion burner to pretreat a portion of the waste not susceptible to biological stabilization, a large equalization lagoon for the pretreated waste stream and additional raw waste, a neutralization tank, a dilution tank in which river water is added to the waste, and an activated sludge plant. The oxidation plant comprises a mixing tank that receives recycled sludge, six aeration tanks and a final settling basin.

• **Effluent standard**—In starting out, Chemstrand had little trouble in determining the degree of waste reduction required. Since the plant is located only seven miles from the mouth of the Escambia River, which distance is traversed by the waste in less than a day, only about 25% of the biochemical oxygen demand (BOD) need be satisfied by the river's oxygen. The river discharges into Escambia Bay and thence into the Gulf of Mexico.

With a minimum design flow of 600 cfs and river dissolved oxygen (DO) concentration never recorded below 5.0 ppm at the plant, the state requirement of a minimum 3.5 ppm DO meant the river could supply about 5,000 lb of oxygen a day. This would satisfy a maximum of 20,000 lb of BOD a day from the plant at critical flow periods. Minimum degree of reduction by treatment was set at 70% since design waste production was determined to be 60,000 lb of BOD a day.

• **Preliminary studies**—Two main waste streams, called waste one and waste two, were segregated and each was subjected to treatment on a laboratory scale. Waste one contained between 25,000 and 40,000 ppm of BOD and 50,000 to 60,000 ppm of chemical oxygen demand (COD) and by itself would not support bacterial growth. Processes investigated were steam stripping, fractional distillation, aeration and biological oxidation.

BOD and COD analyses of feed and finished wastes showed that waste one was best treated by steam stripping while waste two was best handled by biological oxidation.

• **Pilot plant**—At this point, Gibbs & Hill, Inc., New York City consulting engineer, was called in to assist Chemstrand personnel with the remainder of the investigation and development. The consultant recommended that rigorous pilot plant work be started to determine the feasibility of treating waste one by solvent stripping and treating waste two combined with stripped waste one. After toxicity studies were made with the Warburg apparatus, it became obvious that the combined wastes would first have to be diluted and neutralized before oxidation.

Two stripping processes were investigated in a pilot unit: Aeration at elevated temperatures and submerged combustion (burning a gas-air mixture below waste level in an evaporation tank). Neutralization of the combined wastes was studied in the lab.

The bio-oxidation pilot plant study was the most involved and time-consuming phase of the development program. This work first centered on determining optimum conditions of the influent for best process efficiency, including study of pH, dissolved solids concentration, waste dilution and sludge concentration. Then the factors affecting design of the activated sludge facili-

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FOX RIVER BRIDGE near Elgin, Ill. Photo shows progress of work by Arcole-Midwest Co., using SUPERIOR products.

OVERPASS and BRIDGE CONSTRUCTION progressing close to schedule—Entire system is slated for completion Dec. 31, 1958, although some portions will open this summer.

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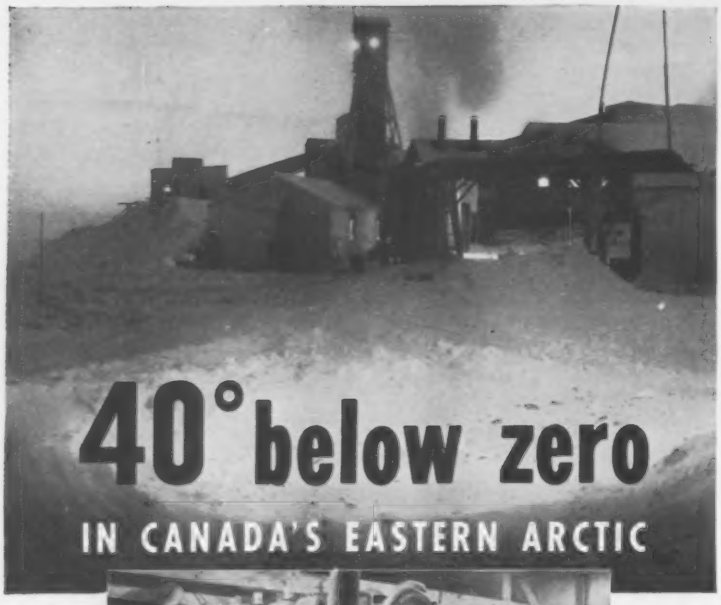

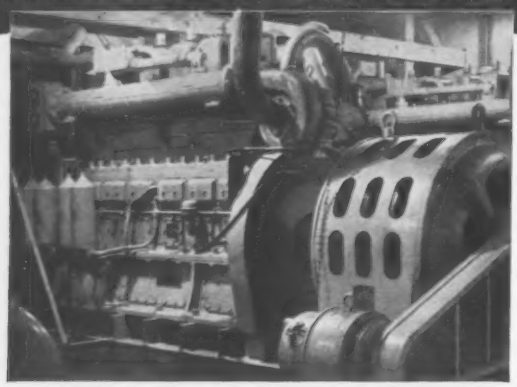

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supply all electric power for mine, mill, townsite and camp

On a northern inlet of Hudson Bay, 1950 air miles northwest of Toronto—where daytime temperatures hit 40° or more below zero, and the miners are Eskimos—is Canada's most northerly nickel mine. In so remote a spot the powerhouse engines must be reliable. They are. Both are Waukesha Diesels. They drive the generator sets that supply *all* electric power for mine, mill, townsite and camp of the North Rankin Nickel Mines, at Rankin Inlet, Northwest Territory, Canada. Production is 250 tons daily; ore is high grade and shipping concentrates run 13% nickel; 2.5% copper. The two Waukesha Diesels are Model LRDBS Turbo-supercharged 6-cyl., 8½ x 8½ in., 2894 cu. in. engines.

•

Waukesha Enginators (engine-driven generator combinations) for Diesel, gas, or gasoline fuels are also available up to 800 KW. Send for literature.

WAUKESHA MOTOR COMPANY, WAUKESHA, WISCONSIN

NEW YORK TULSA LOS ANGELES 378

ties were investigated, such as organic loading, aeration time, sludge recirculation rate, nutrient requirements and method of final solid-liquid separation.

Two pilot units were employed in the activated sludge work. One consisted of two 3,000 gal aeration tanks with appropriate appurtenances. The second employed two 55 gal drums as aeration tanks. The Warburg apparatus played a key role in conjunction with the pilot plants.

Optimum influent waste conditions were determined to be: pH between 6 and 9; dilution on 3 to 1 ratio; sludge concentration of 3,000 ppm. Methods followed to determine activated sludge process criteria were mainly those developed by Prof. W. W. Eckenfelder of Manhattan College.

• **Selection of design criteria**—Design criteria were determined only after all the pilot plant data were in. Submerged combustion was chosen over aeration for solvent stripping of waste one because of economic considerations. The former method could reduce COD concentration by 50% (and over-all BOD by 25%) with a 13 minute retention time. It was decided that ammonium hydroxide should be the neutralizer so that required nitrogen nutrient would be supplied to the sludge.

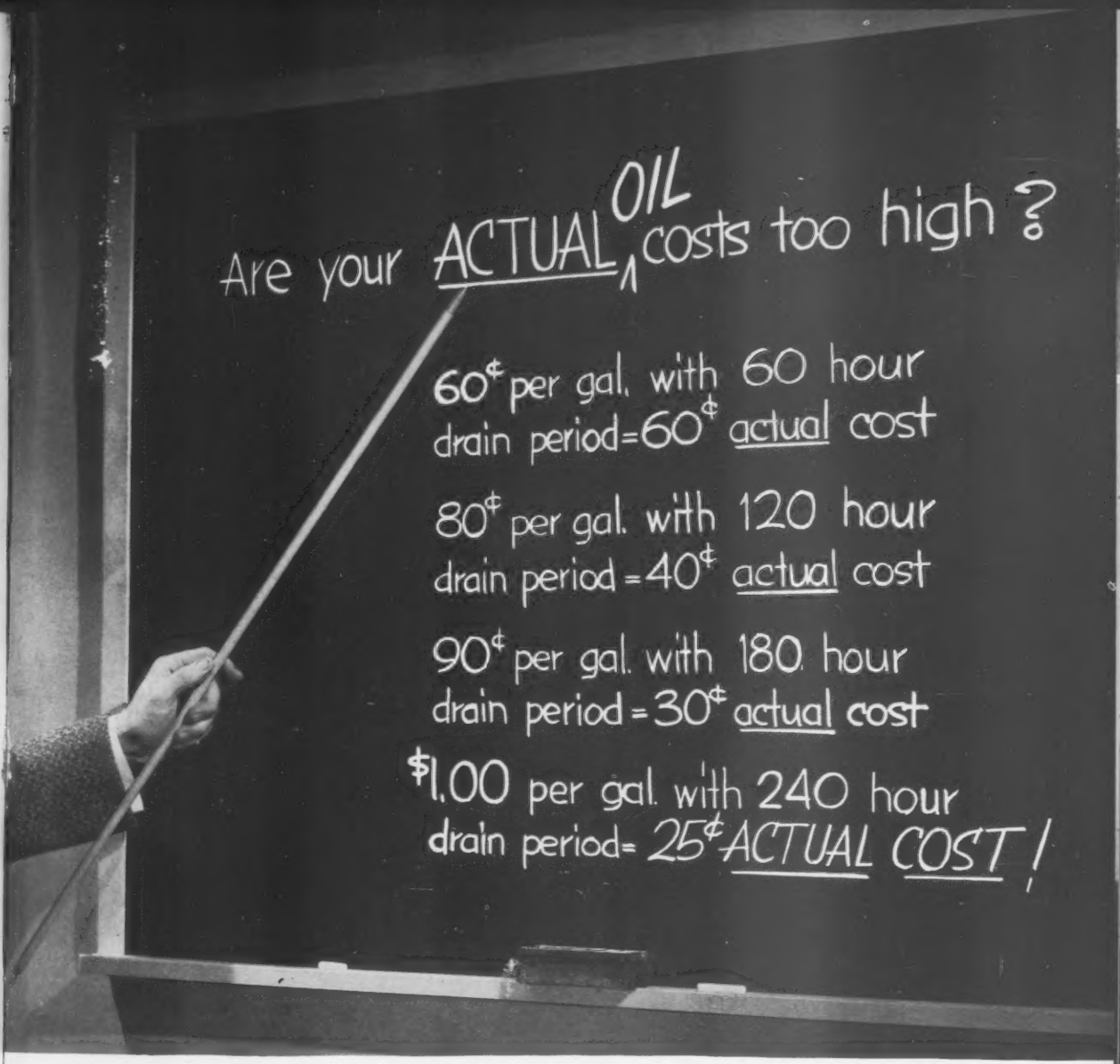
For the activated sludge plant, the vital organic loading figure selected was 1.2 (lb of BOD/lb of sludge) to achieve a more than safe 80% BOD reduction. Air requirement came to 0.75 lb of oxygen per lb of BOD removed, with total daily removal of 28,300 lb.

A final settling tank, designed for an overflow rate of 1,000 gal/sq ft/day, was chosen over a flotation unit.

In terms of final plant hardware, these criteria translated into a 1,600 gal evaporation vessel for submerged combustion, 1.92 mg of aeration tank volume and a final clarifier 70 ft in dia and 15 ft deep.

• **Plant operation**—The treatment plant was completed last October. Operated at 20 minutes detention, the burner achieved 75% reduction. The oxidation plant did 85% BOD reduction. By varying the organic loading to 1.0 and aeration time to 12 hours, a 95% reduction was obtained. There was no doubt then in the mind of Chemstrand Corp. that it had solved its unique problem through an exemplary research and development program.

Authors of the Purdue conference paper were E. D. Remy and D. T. Lauria of the Chemstrand Corp. T. L. Moore represented Gibbs & Hill along with Professor Eckenfelder.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Old and new Carquinez Strait Bridges. Total length of new span is 3,350 feet, four lanes wide. New south cantilever section and part of suspended span appear in foreground at left. Work on north tower, at far right, is in progress. Designer: California Division of Highways. Fabricators and Erectors: American Bridge Division, United States Steel.

Going up:

The Bridge in which USS "T-1" Steel saved $800,000

The Carquinez Strait Bridge is the first major bridge use of USS "T-1" Constructional Alloy Steel, the first large bridge in which all truss members were fabricated by welding, and unique in that the specification of an alloy steel saved $800,000 in construction costs alone.

Like its 31-year-old counterpart, it will connect the San Francisco Bay area with the Sacramento Valley. In profile, the two bridges look like twins, but are vastly different in construction. First, to build the wider, heavier bridge without exceptionally massive members, a weldable, tremendously strong steel was needed. USS "T-1" Steel's yield strength (90,000 psi minimum), combined with its weldability, filled the bill—cutting weight of some members by nearly one-half their equivalent A242 design, and saving $800,000.

Second, welded construction in the new bridge will greatly minimize maintenance expense. It costs about $70,000 yearly to clean and paint the old bridge. By getting rid of thousands of vulnerable rivet heads, edges, lacing bars and angles in the new bridge, members will be less susceptible to corrosion and far easier to maintain.

All in all, 2,910 tons of "T-1" Steel are used in the bridge's most heavily stressed members. Also used: 5,370 tons of USS TRI-TEN Steel, a weldable high-strength low-alloy steel, and 6,440 tons of structural carbon steel. Each of these steels—all available from United States Steel—plays an important role in the bridge, helping to make possible the "most bridge for the money."

For more information. Write for our comprehensive books entitled "T-1" and "TRI-TEN." You'll find in them a wealth of engineering and metallurgical data. Or, contact our nearest representative—you'll find him listed in the telephone directory. United States Steel, 525 William Penn Place, Pittsburgh 30, Pa.

USS, "T-1" and TRI-TEN are registered trademarks

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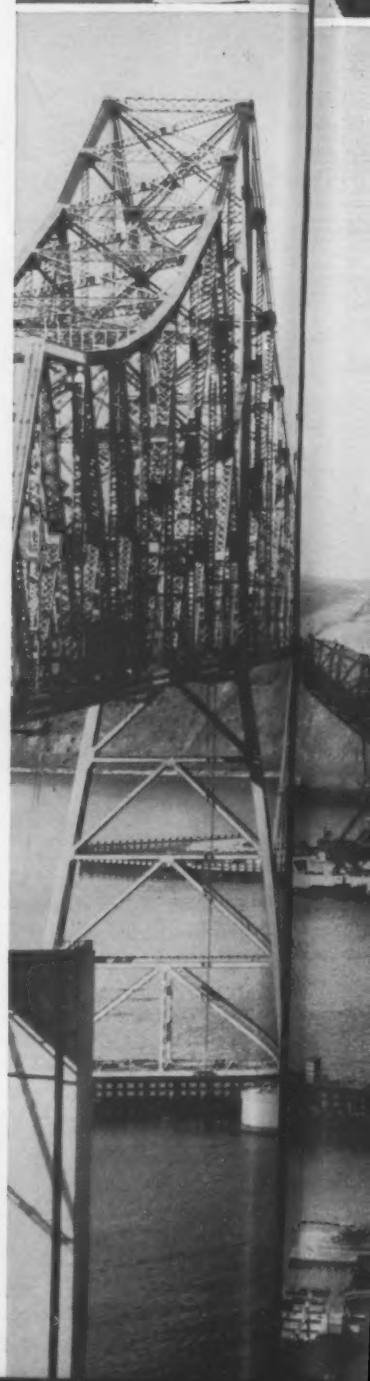
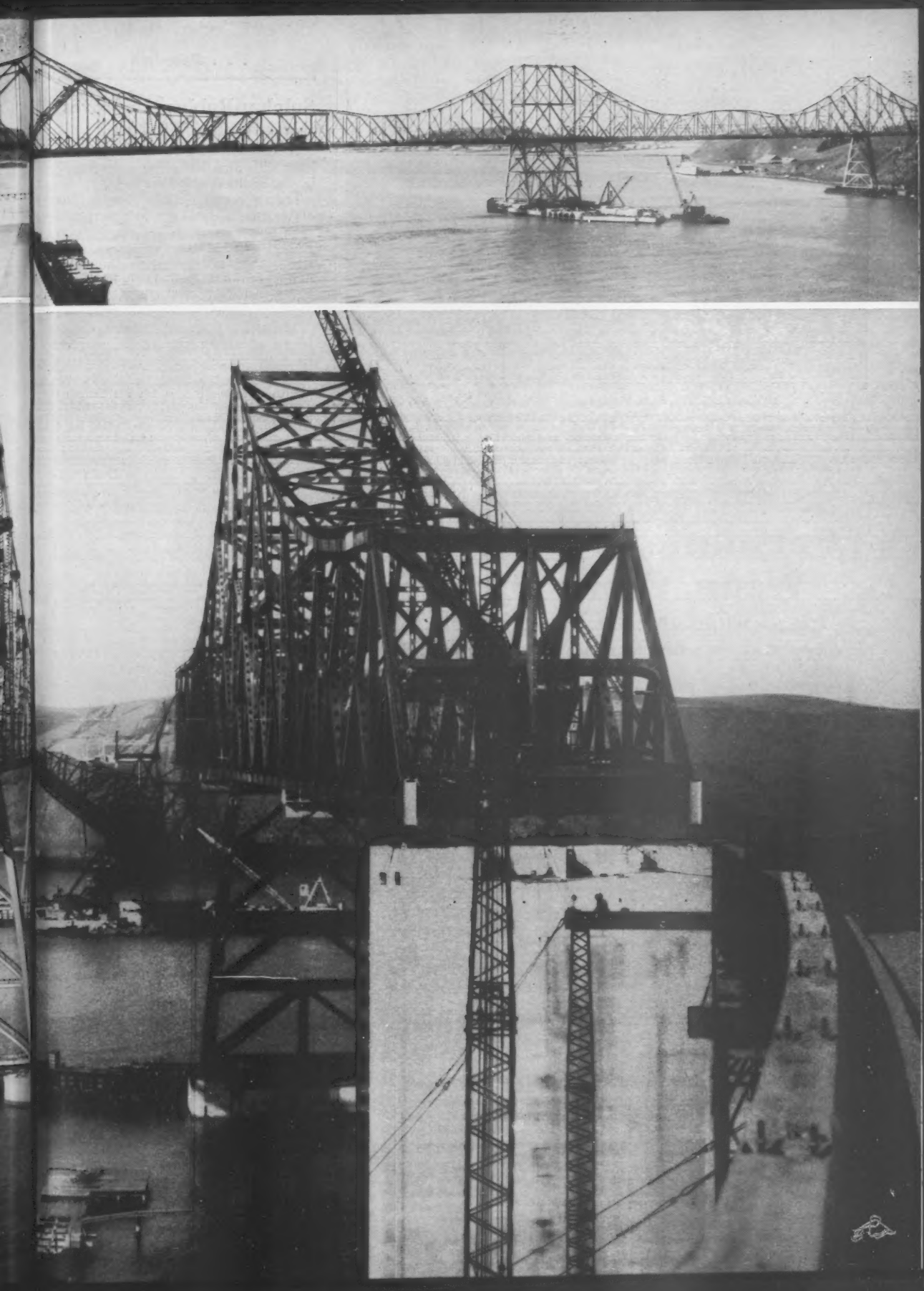
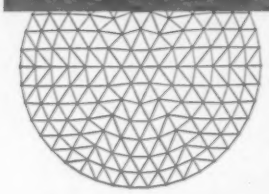


Three things make the new Carquinez Strait Bridge unique in bridge engineering: first, the use of USS "T-1" Steel; second, the use of shop-welded truss members; third, the exclusive use of high strength bolts for field connections.





Reservoir cover, Beaverton, Oregon, is 75 feet in diameter, and rises only 13 feet at the center. The supporting dome is divided into six equal segments in which diagonal members intersect to form a series of triangles. Reactions are distributed evenly around the periphery, eliminating concentrated loads. Cedar tongue-and-groove sheathing was installed over the dome and covered with built-up roof. Cost of cover including dome, decking and roof surface in place is $2.15½ a square foot. Engineers: William Hege and Chester Huston, Beaverton. Doerrie Construction Company of Beaverton was contractor.

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As engineered and fabricated by Timber Structures, Inc., the dome is practical for clear spans of 300 feet or more as well as for the more moderate spans. Heavy tension rings resist the horizontal thrust of the roof load, and massive buttressed walls are not necessary. All timber members of the dome are in compression, so that relatively light section timbers are sufficient. Timber members are joined by engineered connecting devices, and the completed dome is permanently strong and rigid.

In erecting the dome structure, assembly is accomplished largely on the ground, and hoisted into positions in sections. The complete dome structure shown above was hoisted into place with hand winches on three gin poles. Other domes of over 200 foot diameters also have required nothing but hand winches during erection.

To assist in designing timber dome structures, Timber Structures, Inc. offers the cooperation of its experienced timber engineers in whatever degree may be desired. For further information, see your Timber Structures representative, or write us.

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Sulphur-Rubber Improves Road Asphalt Mixtures

A method of improved blending of latex with asphalt has been developed by the addition of sulphur.

The new process—culminating months of research by J. York Welborn and John F. Babashak, Jr., of the Natural Rubber Bureau Research Laboratory—is described in a paper in the latest Journal of the Highway Division, American Society of Civil Engineers.

The use of natural rubber in America in asphalt mixtures was confined mainly to the addition of dry rubber powder. Recently, however, there has been an interest in developing rubberized asphalt material for surface treatment work. And it appeared that rubber in latex form would be easier to use than dry rubber, providing it could meet certain requirements:

- The latex must change the properties of the asphalt to give improved binder performance.
- It should form a homogeneous composition.
- Excessive heat should not be necessary to disperse the substance.
- The flow properties should be amenable with normal construction practice.

But it was found that latex alone would not give these results. To get the required results, the laboratory experimented with a number of commercial additives—vulcanizing agents and accelerators. Of all the agents tried, sulphur proved best. The sulphur and natural rubber combination improved blending conditions and greatly bettered the over-all properties of the rubberized asphalt—with less than 0.3% sulphur required for best results.

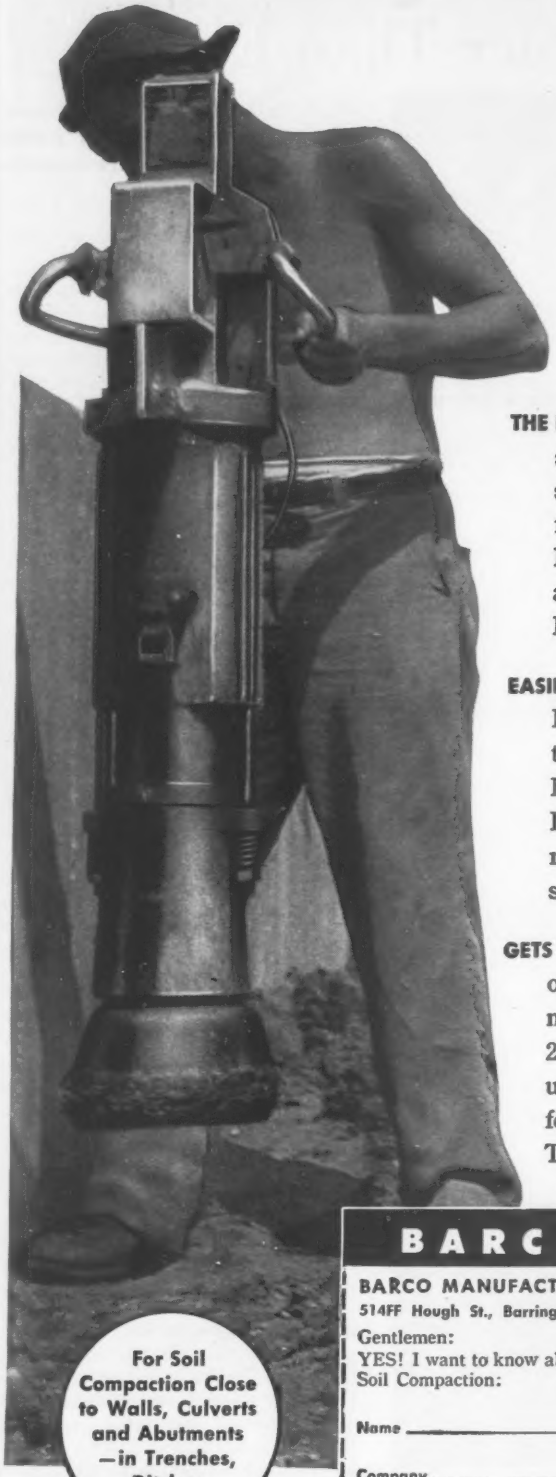
The research has shown that small amounts of sulphur added to the latex for mixing with asphalt will improve blending conditions and increase the rubber's effectiveness. The following effects were noted:

- Reduced blending time at lower temperatures
- Improved stability under storage
- Increased ductility at low temperatures
- Increased toughness and tenacity

Plans are now underway to use sulphur-processed rubberized asphalt in a number of road surface treatment tests.

The published report fully describes how the rubberized asphalts are prepared as well as the various test methods used in evaluating the materials. It also details the test results with charts, diagrams and illustrations. It is available without charge from the Natural Rubber Bureau, 1631 K St., N. W., Washington, D. C.

WHEN CONSTRUCTION JOBS CALL FOR SOIL COMPACTION



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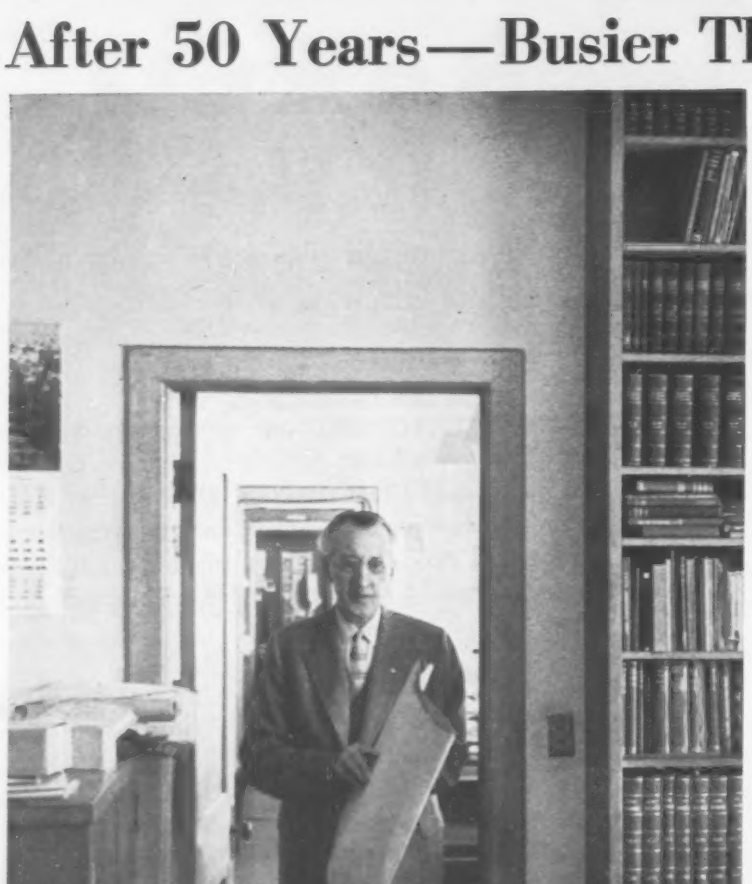

HENRY BRUNNIER opened his San Francisco office in 1906 and for the past half-century has done the structural design for many important buildings in the Far West.

Shifting from East to West paid off for Henry Brunnier, noted designer of skyscrapers in earthquake regions

Fifty years ago—on June 1, 1908—Henry J. Brunnier opened an office in San Francisco as a consulting structural engineer. Since then he has done the structural design on many important buildings in San Francisco and in the Far West. And in the past few years he has been busier than ever.

Among Brunnier's jobs that are now under construction is one of the most exciting structures ever built in San Francisco. It's the 20 story, $15 million Crown Zellerbach building with a 63 ft office tower section only one bay wide (see p 37).

Many important projects are on the boards, like a new 20 story, 300,000 sq ft (net usable area) office building for Standard Oil and the 25 floor, 111 Pine building being designed with consulting architect Wm. Leseaze of New York. The current and upcoming work may well overshadow important earlier work in San Francisco that includes among many others the Russ building, the Standard Oil building, the Shell Oil building, the Federal Reserve Bank and the 111 Sutter building.

Not all of the Brunnier organization's structural design has been devoted to buildings. Coming out of his office were baseball parks, wharfs, bridges, Army and Navy installations and many other things. But all of them had one thing in common—careful structural design.

Henry Brunnier—or "Bru", as he is called by his contemporaries—believes he is the first person to use the title structural engineer. As such, much of his business has been furnishing a structural design service to architects. He estimates it at about 60% of the total. The rest has been working directly for clients primarily in design of industrial plants. On some jobs, owners have selected the Brunnier organization for structural design and asked their architect to go along with their choice.

Such was the case for the Crown Zellerbach building. Architects are Hertzka & Knowles and Skidmore, Owings & Merrill, associated architects. Hertzka & Knowles, although one of San Francisco's oldest architectual partnerships, had never worked with Brunnier. Since then, however, they have

B Tournapull with 27-yd. Fullpak® scraper climbs approx. 3/1 grade over top of 100′ hill, to load downhill on opposite side. Hammersley Construction Co.'s Tournapulls removed huge embankment from new right-of-way, hauled material to the southeast end of job, in far left background.

Madison, Wis., Contractor's 27-yd. "B" is push-loaded down approx. 2/1 hillside, moving dirt for additional 2 traffic lanes on Wisconsin 57-32, near Millhome. Foreman Dick Sheppard estimates payloads averaging 20 yds., in the 3000 lb/yd. material. This machine moved 11 loads in less than 1¼ hrs.: averaged 47 sec. to load, 6 min. 14 sec. for 5510′ cycles.

210 hp C Tournapull with Fullpak scraper "highballs" over previously filled roadway, with a 15-yd. payload. Two older C 'Pulls' were also on the job . . . one on hill-cutting project . . . the other dug ditches and hauled on short cycles. Boulders of the size shown were encountered in the hillside cut.

Cut-down 100′ hill to build 3rd and 4th lanes on Wisconsin Highways 57-32

Hammersley Construction Co., Madison, built an additional 2 lanes of high-speed road, to make a 4-lane divided highway of Wisconsin Highways 57-32, between Kiel and Millhome. Contractor's 3.8-mile project connects to a similar section being constructed to speed motorists between these two towns.

One of the problems Hammersley faced on the 330,000-yd. dirtmoving job, was a hill about 100′ high, near Millhome. This large mound of sand, gravel, rock, and loam, had to be cut-down to make a level highway. The hill's toe had been removed when the original 2-lane road along the Sheboygan River was built, leaving a cliff-like bank. Photos show how Contractor's LeTourneau-Westinghouse Tournapulls® climbed to the top of the approx. 3/1 slope, loaded downhill on about 2/1 grade, then hauled material half a mile southeast to raise a low area.

Tournapulls have proven their ability to work efficiently in all sorts of tough conditions from the tropics to Alaska . . . over hills, in mud, sand, hardpan, swamps, dust . . . almost anything you can name. Call or write for a demonstration. See how these rugged machines move more dirt faster . . . how they cut cost-per-yard and boost profits. Three sizes: 9, 18, 27 cu. yds. heaped.

Hammersley Construction Co.'s 18-yd. C Fullpak spreads sand-gravel-rock fill to build-up spongy low area for new S.T.H. 57-32 roadway. On 5510′ cycles, Fullpak got heaped loads in 27 sec., hauled, then spread over 100′ in 14 sec., completed the circuit in just over 6 minutes. Fast, dependable Tournapulls moved dirt steadily . . . helped contractor finish the job in the scheduled 170 days.

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SPECIFICATIONS of an office building for Standard Oil and the 25 story, 111 Pine Building in San Francisco are discussed with Harry Powers, Brunnier's second in command.

retained the Brunnier organization for the new Standard Oil building. Wayne Hertzka says, "We have a great respect for the Brunnier group. They are contributing substantially to the design because of their experience with multi-storied structures—particularly in San Francisco with its peculiar foundation and earthquake problems."

• **Iowa farm boy**—Born in 1882 on a farm near Manning, Iowa, where he received his high school education after attending a one-room country school. Bru went to Iowa State College to take engineering. There he was inspired by one of the outstanding engineering educators of all times—Dean Anson Marston.

After graduation, Henry Brunnier worked for about a year as a steel detailer for the American Bridge Co. in Pittsburgh. Following this he went to New York to do structural design for the New York Edison Co. While he was in New York, a casual luncheon conversation by his boss and the 1906 San Francisco earthquake and fire teamed up to transplant Henry Brunnier to San Francisco for the rest of his career. Right after the earthquake, Ford, Bacon & Davis, New York consulting engineers, were retained to design and supervise the rehabilitation of the street railway system in San Francisco. But they couldn't find any of their staff members willing to go out to the wild, wild West.

• **Young man goes West**—One of the Ford, Bacon & Davis executives complained to Brunnier's New York Edison boss at a lunch that all of his engineers were MIT graduates and wouldn't go west of the Hudson. The Edison man responded, "I have on my staff a big blond from Iowa who is not afraid of Indians." Result was that Bru was "loaned" for the job and arrived in San Francisco May 4, 1906, just two weeks after the 'quake.

When his work with Ford, Bacon & Davis was completed, Henry Brunnier stayed in San Francisco instead of returning to New York. He saw the opportunity to go into private practice that resulted in his opening his own office 50 years ago.

Brunnier observed that most of the structural design in San Francisco at that time was done by representatives of steel companies or reinforcing bar firms. He noted that the architectural plans usually carried governing stresses and left it up to the various materials representatives to submit on a competitive basis a structural scheme to support the building. Brunnier believed that owners and architects would be better served by having the structural system designed by other than the commercial interest. So in setting up his own office, he called on all the architects in San Francisco and on owners about to undertake a project to sell them on this idea. It took time, but the message eventually got across.

• **The private practitioner**—The year 1908 was not a particularly good one to start a new business; it was a depression year. True, there were lots of San Francisco buildings yet to be reconstructed and new ones to go up, but some owners still had the idea that San Francisco was to remain a ruined city.

Consultant Brunnier's first efforts

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During the past few years the popularity of this heavy-duty rubber-tired tractor has increased rapidly, and there's good reason for it! As work areas grow bigger and bigger, the need for tractor *speed* and *mobility* becomes more and more important. And speed and mobility, as well as power and traction, are the plus-values you get in the 17 mph, 210 hp Tournatractor.

The place for Tournatractor in your fleet is on hit-and-run jobs, stockpiling, haul-road maintenance, backfilling, towing compactors, leveling fill, handling production push-loading, doing widely-scattered dozing jobs that you want done in a hurry. There's no waiting for truck and trailer, no time lost loading and unloading. Tournatractor "runs" from job to job, often completes one job and begins another before a slow-moving crawler gets started. The price?... probably *less* than any other tractor of similar weight and horsepower, and certainly less expensive to maintain and operate.

It will cost you nothing to *find out* about Tournatractor. Fill out the above "request for demonstration" on one of your jobs. Mail it to your LeTourneau-Westinghouse Distributor.

Operators like Tournatractor's smooth torque converter that balances power to load... its electric push-button controls... its up-front clear view... its big, safe-stopping brakes. And you will like the *extra* daily job completions your operators will be able to turn in!

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Contractor: Neighborgall Constr. Co.

TO BEAT the river's rise and to finish his job during low water level, the contractor asked Griffin for fast dewatering action.

A DRIVE-CASING sand-wicked well-point system was installed, in 3 days, through silt, sand and clay layers. 48 hours pumping dropped ground-water below subgrade.

Two days later, the bottom slab was poured—another wet job handled speedily and economically, without sheeting, by Griffin.

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West Palm Beach, Fla
In Canada: Construction Equipment Co., Ltd.
Toronto Montreal Halifax

PRODUCTION TEAM of Andy Steven, Charles DeMaria, Herb Lyell, and Stan Teixeira, shown with Brunnier and Powers, head up design efforts in the office.

were small jobs like shop inspections and structural detailing—leaning on his experiences with American Bridge. And he did quite a number of county bridges in the early years.

Other early work included many San Francisco waterfront structures for the State Board of Harbor Commissioners. On another waterfront job, Bru gave early evidence of professional integrity that has marked his entire career; this 1913 job was a 3,000 ft pier supported by creosoted timber piles designed for 20 year service but still in use today. Although he needed the job badly, Bru refused to lower his fee when confronted by the city council with a lower competitive fee. He got the job and the Mayor told him, "Young man, if you cut so much as a penny from your charges, you wouldn't have gotten the job."

One of his first big buildings was the Sharon building, located on New Montgomery St., just across from the Palace Hotel. When this eight story structure was completed in 1913, Henry Brunnier moved his office into it and has been there ever since.

• **Earthquake design**—The Palace Hotel is partly responsible for some of Henry Brunnier's basic theories on earthquake-resistant design. Although substantially damaged by fire, the structure of the hotel remained standing after the 1906 quake. Brunnier puzzled over why this happened when so many other buildings were shaken down or badly damaged. Finally he noted that anchors at each floor level held the floor securely to the wall. He concluded that the resulting diaphragm action of the wood floors was responsible for structural safety of the building. He figured that "the walls won't move out if the floors won't let them."

As a result, he adapted this idea to all of his building designs. His philosophy of earthquake-resistant design was to tie elements together and use sound engineering judgment; he admits that design practices have since been developed for earthquake resistance based on a more substantial theoretical background.

Consulting engineer Henry J. Degenkolb, who is currently president of the Structural Engineers Association of California, says, "Henry Brunnier is one of the leaders in earthquake design. His early recognition of the need for and his continued efforts at promoting the necessity for sound earthquake design practices have done much for structural engineers and buildings throughout the West."

• **Good years and bad**—Although the level of business that Henry Brunnier has handled in the last 50 years generally has been good, there have been times when he was literally scraping the bottom of the barrel. In the depression years of the early 30's, his staff was down to three people—two of whom are still with him today—his chief lieutenant, Henry C. Powers, and his secretary-bookkeeper, Miss Dorothy J. McKenzie.

Bru was about to go out of the business in 1930 when he was saved by appointment to the consulting board for the San Francisco-Oakland Bay Bridge. This board included some of the most famous engineers of the time including Ralph Modjeski as chairman, L. S. Moisseiff, Chas. Derleth, Jr., and Moran & Proctor represented by Daniel E. Moran. Of the group, Brunnier is the only one still alive. Function of the board was to advise the bridge designers on all phases of their design and

construction program. That this was successfully done is attested to by the fact that the bridge is considered by the American Society of Civil Engineers to be the most outstanding bridge project in U.S. construction history.

Another event that gave the Brunnier structural design business a "shot in the arm"—as it did for many other California firms—was the 1933 Long Beach earthquake. This resulted in a state law requiring schools to be designed to resist temblors. A sizable share of Henry Brunnier's work is still on schools, including in recent years San Francisco public schools valued at about $10 million. Paralleling that is design on $15 million worth of University of California educational buildings.

• **Staff buildup**—Just prior to World War II, Brunnier began a major buildup of his organization to handle military design work. His most important project included extensive facilities in the Panama Canal Zone, where he had a sizable staff. At the peak of World War 11 operations, the Brunnier organization totaled 60 people, most of whom were engineers.

Total present staff is relatively small for a major engineering office—only 17. Running the organization is Henry C. Powers, who has been affiliated with Brunnier for more than 41 years.

Four of the "Panama" group now head up the design efforts in the Brunnier office. Included are Herbert L. Lyell, Charles D. DeMaria, Stanley E. Teixeira and Andrew P. Stevens—Boss Brunnier refers to these men as his "production team."

It is noteworthy that in 50 years, Henry Brunnier has never had a partner. That's partly because Henry Powers in his devotion to "the chief", preferred to maintain his position as an employee. As an employee, however, he for years has had complete power of attorney to execute contracts and handle financial affairs. So, in effect, he acts as a partner. He, Lyell, DeMaria, Teixeira and Stevens all share in the business.

To perpetuate his organization, Brunnier has a provision in his will leaving the organization to Sidekick Powers and the production team. He has no family except for his wife; their only son died in 1937.

Henry Brunnier hasn't spent all of his time on business efforts. A tall lean man even at 75, he has always been athletically inclined. An outstanding baseball pitcher in his youth, he made as much as $40 a game pitching for semi-pro teams in the New York area.

CONSTRUCTION SITE visits by Brunnier, who likes to keep in close touch with the progress of his jobs, are a frequent occurrence.

This was more than he was making a week, at the same time, working over a drafting board. At one time, while pitching for U.S. Steel's Homestead Works in Pittsburgh, Bru was approached by Honus Wagner—Pittsburgh's famous "Flying Dutchman" and member of baseball's Hall of Fame—for a tryout with the Pirates. But he preferred to stick to engineering, even though he had fond dreams of being another Christy Mathewson.

The athletic Mr. Brunnier took up golf after he passed the age of 40 and at one time held a 7 handicap. He is still a twice-a-week golfer.

• **Rotary president**—Mr. Brunnier's outstanding non-professional achievements are not athletic. He has served as president of both the American Automobile Association (1945-47) and Rotary International (1952-53). For both, he became an international ambassador of good will. Just after World War II he made an extensive trip for AAA through South America to re-establish relationships with auto clubs on that continent. And he has visited Rotary clubs throughout the world.

"A community can't be prosperous unless someone helps make it so. If nobody furnished the leadership, there wouldn't be a community—a prosperous one, anyway," he says.

Says San Francisco consulting engineer, John A. Blume: "Henry Brunnier's service to Rotary and AAA has done much to enhance the standing of west coast structural engineers. People who he has met in this work learned what a structural engineer is."

Mr. Brunnier also helped found the Structural Engineers Association of Northern California and served as president of the group for the first two years of its existence. He has been president of the San Francisco Section, American Society of Civil Engineers. And as president of the San Francisco Engineers Club, he helped pull the club through the depths of the depression.

When the civil engineering registration law was passed in California, Henry Brunnier became one of the original members of the registration board. As such he helped establish qualifications for registration in California that make civil engineering registration in that state one of the most exclusive in the U.S. today.

Still going strong at 75, Henry Brunnier seems to have found Ponce de Leon's fountain of youth. Many long-time associates comment that he hasn't seemed to age in the years they have known him. And he has maintained a remarkably youthful outlook in business and personal life. He has no thoughts of retiring and will probably "die with his boots on"—in the Western tradition.

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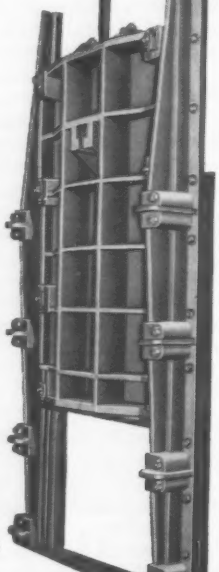

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Obituaries

Josiah Newcomb, 54, assistant vice president of Gibbs & Hill, Inc., New York City consulting engineer, died in Mineola, N. Y., May 6. Mr. Newcomb was in charge of railroad engineering for his firm and directed electrification improvements on the Pennsylvania Railroad. He also administered design of steam, electric and hydraulic facilities at AEC's Savannah River Project.

William L. Havens, 64, head of the Cleveland engineering firm of Havens & Emerson, died April 26 in Cleveland. A 1916 graduate of Cornell University, he was employed in Cleveland's sewage disposal department before joining the firm of George Gascoigne & Associates in 1922. In 1940, he formed Havens & Emerson which designed numerous water and sewage plants over the years, notably for the city of Cleveland. Mr. Havens was a past president of the Cleveland Section, American Society of Civil Engineers.

V. J. Knezevich, 71, president of Red Eagle Corp., road contractors of Columbus, Ohio, died April 28

Alfred E. Henderson, 65, president and treasurer of Penzieri-Henderson, Inc., Albany, N.Y., contractors, died April 14.

Edward L. Alsop, 46, resident highway engineer for Halifax and Charlotte Counties in Virginia since 1952, died April 10. He had been with the Virginia State Highway Department since 1929.

Harold C. Boyd, 60, vice president of Virginia Steel Co., died April 7 in Richmond.

William A. Pugh, 81, founder of the Pugh Brothers Construction Ltd., Toronto, Ont., died April 28.

Daniel G. Fries, 64, owner of Fries & Son Steel Construction and Engineering Co., Covington, Ky., died April 16.

Frank O. Witchell, 78, a Dallas architect, who designed more than 20 of the city's principal buildings, died April 23. Among the buildings he helped plan are those of THE DALLAS TIMES HERALD, First National Bank, Sanger's, Linz, Fair Park Music Hall, and Southwestern Bell Telephone main exchange.

Clyde H. Billingsley, 59, a Columbus, Ohio, homebuilding contractor and wartime chief of the area structural division, Engineer Board, of the U. S. War Department, died April 10.

Unit Prices

Railroad Underpass Bid in Louisville

Six bidders competed for this $435,469 underpass in Louisville, Ky., to eliminate grade crossing of the Southern RR. The award by the city to J. U. Schickli & Bros., Louisville, was on a low bid which was 8.6% below the next higher and 9% below the engineer's estimate. Hazelet & Erdal, Louisville, are the consultants to the City of Louisville.

The railroad will be carried over the street on a 65 ft deck plate girder on reinforced concrete abutments. Contract includes 1,200 ft of retaining walls and 1,200 ft of approaches and sewer construction.

Railway traffic must be maintained during construction.

Class A concrete is 3,500 psi, 6 bags cement per cu yd; class B, 2,500 psi, 5.2 bags of cement per cu yd.

Prevailing wages on the job include: tractor, shovel and crane operators, $3.275; concrete finishers, $3.30; common laborers, $2.25.

The six bids went like this:

1C	J. U. Schickli & Bros., Louisville, Ky	$435,469
2	Henry Bickel Co., Inc	476,399
6	Harry O. Wyse, Lexington, Ky	567,002
EE	Hazelet & Erdal, Louisville, Ky	479,130

Bids: 3-18-58 Items	Unit	Quantity	Unit Prices 1C	2
Conc, cl B, base with integr curb, 7"	sy	6,030	$4.60	$4.50
8"	sy	2,130	4.28	4.35
Excavation, roadway	cy	39,900	0.88	1.75
unclas struct	cy	5,560	4.00	3.10
Conc, cl A	cy	2,554	49.00	58.00
superstructure	cy	93.8	83.00	88.00
Steel reinforcement	lb	226,140	0.125	0.115
Fence, chain link, 7'	lf	1,150	3.20	3.25
3'	lf	55	3.40	3.50
Asph conc surface	t	655	7.50	7.50
Paint coat	sy	7,920	0.05	0.04
Conc sidewalk, cl A, 4½"	sy	2,340	3.60	3.50
Conc sewer, 42"	lf	580	37.25	50.00
21"	lf	70	25.60	38.00
15"	lf	60	9.00	7.00
12"	lf	415	7.00	11.50
8"	lf	105	5.00	4.00
6",perf	lf	1,162	2.25	3.25
CMP drains, perforated, 8"	lf	76	3.00	1.85
Monolithic conc sewer, 42"	lf	75	93.00	72.50
MH, spec, with 42" tide gate	ea	1	965.00	1,055
15" tide gate	ea	1	436.00	475.00
2-12" tide gates	ea	1	576.00	575.00
with drop inlet	ea	1	972.00	980.00
standard	ea	1	468.00	480.00
Catch basin, type 2	ea	18	235.00	220.00
special	ea	2	350.00	450.00
abandon	ea	7	50.00	30.00
MH frames, adjust	ea	7	50.00	35.00
Sodding	sy	2,570	0.60	0.35
Seeding	sy	300	0.20	0.15
Fire hydrant, remove & reset	ea	3	250.00	150.00
Fence, remove & reset	ea	250	2.00	2.50
remove	ea	50	0.75	0.50
Trees, 12" & larger	ea	4	50.00	55.00
Conc driveway, cl A, 6"	sy	765	4.70	4.95
steps	cy	5	110.00	100.00
alley intersection	sy	55	4.60	4.95
encasement	cy	3	30.00	30.00
Sheet piling, temporary	ls	job	18,100	7,000
Mac surf, cr stone, 6"	t	500	2.75	3.10
Spiral shear developers	lb	2,090	0.60	0.64
Waterproofing, cl C	sy	211	12.00	11.50
Bridge railing	lf	132	31.00	28.00
Abutment cofferdams	ls	job	24,352	12,425
Aluminum name plaques	ea	2	225.00	235.00
Grading for temporary tracks	ls	job	400.00	1,500
Steel, structural	lb	283,000	0.195	0.21
Demol. of gas station	ls	job	500.00	500.00

Commence: 5-18-58 Complete: 5-19-59
Liquidated damages: $150/day

North Carolina Highway Prices

1957 Average Unit Prices Bid on Major Items

Roadway	Unit	Avg. Price
Clearing	ac	$223.00
Grubbing	ac	142.00
Excavation, roadway	cy	0.42
borrow	cy	0.42
Base course, soil type	cy	1.04
coarse aggregate	t	2.31
sand asphalt	t	5.39
Bituminous surface treatment	sy	0.34
concrete binder course	t	5.97
surface course	t	6.29
Sand asphalt surface course	t	5.69
Concrete pavement, 9"	sy	3.80
RC pipe, 15"	lf	2.84
18"	lf	3.64
24"	lf	5.37
30"	lf	7.44
36"	lf	10.15
42"	lf	13.70
48"	lf	16.17
54"	lf	20.03
60"	lf	25.00
66"	lf	29.08
CMP, tp B, 15"	lf	3.58
18"	lf	4.29
24"	lf	6.48
30"	lf	8.00
36"	lf	12.50
48"	lf	18.00
54"	lf	25.00
66"	lf	32.00
Structures		
Conc, cl a	cy	61.85
Steel, reinforcing	lb	0.125
structural	lb	0.15
Creo timber piling	lf	3.20
Prestressed concrete girders	lf	22.21
piles, 12"	lf	5.73
20"	lf	11.21
Piles, precast concrete, 20"	lf	7.75
steel H, 12"	lf	6.50
14"	lf	7.50

Indiana Highway Prices

1957 weighted average low unit prices reported by the Indiana State Highway Department

Items	Unit	Quantity	Average Unit Price
Road			
Exc, common, over 100,000 cy	cy	2,583,713	$0.55
spec borrow, over 50,000 cy	cy	506,474	0.62
Overhaul	cy	618,417	0.05
Added haul	cy	357,998	0.06
Pipe, cl VII, sub surf drains, 6"	lf	79,515	0.92
cl I, 12"	lf	6,699	3.25
cl I, 15"	lf	4,348	4.31
cl I, 18"	lf	4,549	5.05
Aggr for sub surf drains	cy	13,638	4.58
Subbase, type I or II	cy	71,007	2.21
Reinf conc pavement, 8"	sy	144,084	4.60
9"	sy	563,396	4.75
Contraction jts, tp D1, D4 & D5	lf	158,230	1.18
Asph conc, hot, base	t	159,702	6.56
binder	t	543,256	6.74
surf, type B	t	274,515	7.13
Sodding	sy	575,965	0.45
Bridge			
Conc, cl F	cy	12,861.4	74.21
cl D	cy	3,272.2	70.25
cl E, footings	cy	5,697.9	61.68
railing	lf	14,395.7	10.84
Steel, reinforcing	lb	4,462,657	0.1372
structural	lb	7,513,158	0.2033
Piles, untreated timber, f	lf	38,120	0.82
dr	lf	30,824	0.75
Pile shells, steel, f	lf	30,765	5.44
dr	lf	30,635	2.96

Wgtd low avg bid is total $ for all contracts on a particular item, divided by total quantities for such item for one year

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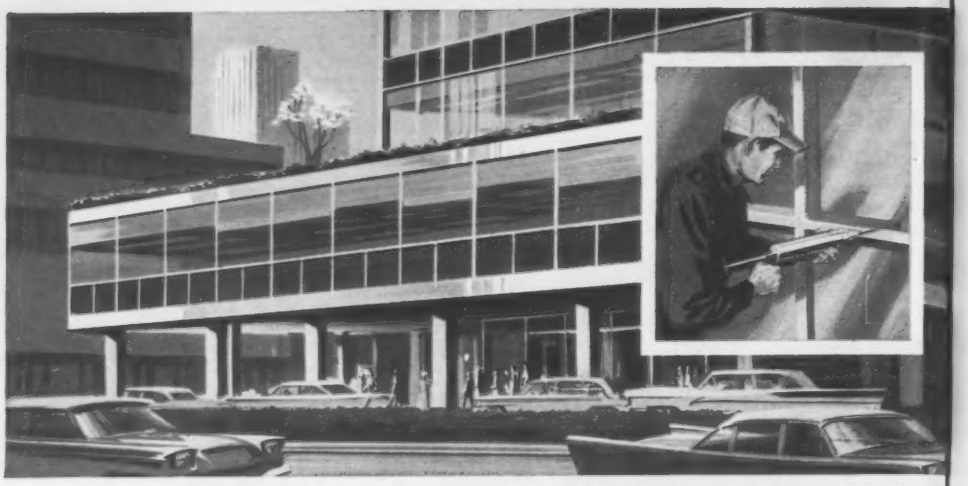

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Atlanta	$70.00	$80.00	$43.80	$70.00	$70.00	$127.00	$70.00	$1.30y	$60.00	$2.00b	$75.00	.....	.....
Baltimore	61.70f	45.55f	34.25f	55.35f	65.00f	106.50f	69.00f	1.30	66.50	1.50	45.00	$4.00g	$33.50
Birmingham	73.00	80.00	47.77	75.00	65.00	138.50	81.00	1.40	70.00	1.60	75.00	3.30g	.....
Boston	60.00m	50.00m	38.00m	60.00m	65.00m	120.00m	79.00m	1.45	75.00	.....	65.00	5.30	63.50
Chicago	67.00	84.00	45.00	69.00	67.00	132.00	67.00	1.55	80.00	.....	63/65i	5.35g	.....
Cincinnati	48.00w	43.55w	32.05w	51.10w	70.00w	125.00w	73.50w	1.30	63.00	1.30	75.50	3.12½	50.00
Cleveland	62.00	56.50	41.50	65.00	75.00	135.00	80.00	1.35/1.50	75.00	.....	55.00*	17.50o	55.00
Dallas	55.00	52.50	42.50	60.00	68.50	117.50	68.50	2.00	62.25	1.45	66.15	4.35g	.....
Denver	63.00	54.50	41.00	62.00	75.00	126.00	74.00	.....	71.00u	1.30u	60.00u	11.00r	21.00
Detroit	64.00	54.00	37.00	68.00	69.50	90.00	69.00	.....	.....	1.95b	68.00	.....	.....
Kansas City	65.00	55.00	40.00	.....	73.00	115.00	78.00	1.40	75.00	2.00	75.00	3.60d	.....fy
Los Angeles	66.00	60.50	0.33s	63.00	75.00	125.00	80.00	.....	83.00	1.35s	64.00	4.40g	.....
Minneapolis	76.00	65.00	0.41s	80.00	78.00	140.00	78.00	2.00	80.00	1.50	80.00	5.50	.....
Montreal	56.00	47.40	26/29	53.00	63.25	.....	63.00	1.50	66.00	1.50	66.00	9.00q	56.00
New Orleans	60.00	50.00	46.00	60.00	75.00	140.00	72.50	1.75	65.00*	.....	.....	.....	.....
New York	55.25	47.25	36.25	54.25	75.00	120.00	75.00	1.55b	68.50	1.55b	68.50	4.38i	52.50c
Philadelphia	50/55	48/53	34/40	49/54	68/73	105/110	55/65	.....	60/70	.....	70/75	5.60/6.34	40/50
Pittsburgh	70.00	65.00	40.00	.....	62.50	102.50	57.50	1.05s	55.00s	1.05s	55.00s	3.80i	38.50
St. Louis	67.00	56.50	40.00	70.00	76.50	121.50	80.00	1.35	65.00	1.65	70.00	4.50i	.....
San Francisco	57.00	48.00	0.35s	58.00	68.00	109.00	67.00	1.60	66.50	1.60	66.50	4.95	55.00
Seattle	68.30	51.65	51.05	65.00	74.50	125.00	75.50	1.60z	74.00	1.90*p	80.00*i	4.25	46.80
Toronto	55.00	47.00	38.00	64.50	75.00	.....	.....	1.50	62.50	.....	62.50	16.50o	46.00

*a F.o.b. warehouse. *b Sani thick. *c 30¢ bag. *d 12" to 24" width. *e 40¢ kraft paper, 5 Msf, 100/500 rolls. *f 20¢ sq ft bag, 4" thick. *g Full trailer loads. *h 80¢ kraft paper backing. *i LCL. *j 40/. *k 80/. *l 2". *m 10 ton quantities. *n Distributor's siding. *o Per Msf roll. *p 32½ bag. *q 300 sf. *r Per cwt *s 35¢ bag. *t 28¢ bag. *u Flame proof $75. *w F.o.b. city. *x Sq yd. *y Temporarily off market *z Spun rock wool, 3½ cu ft bags

HOURLY WAGE RATES—Base rate + fringe benefits

	Bricklayers	Carpenters	Struct. Iron Workers	Hoisting Engineers	Plasterers	Electrical Workers	Steamfitters	Common Labor—Building	Common Labor—Heavy Cons
Atlanta	$3.60	$2.95	$3.15+7½¢d	$3.225	$3.125	$3.30+21½¢	$3.30+25¢d	$1.60	$1.60
Baltimore	3.80+10½¢d	3.20+7½¢d	3.75+7½¢d	3.80/3.95+10¢g	3.45+7½¢d	3.425+7½¢	3.30+7½¢d	2.05+7½¢d	2.05+7½¢d
Birmingham	3.75	2 85	3.25+10¢d	2.65a	3.05	3.425	3.32+10¢d	1.65	1.75
Boston	3.65+15¢d	3.25+10¢d	3.70+20¢e	3.77½+10¢f	3.65+20¢	3.55+12¢g	3.20+10¢d	2.55+7¢d	2.50+7¢d
Chicago	3.82½+7½¢	3.45+20¢e	3.90+15¢d	3.40+5¢e	3.70+23¢	3.65+22¢f	3.55+22¢ee	2.77½+7½¢	2.77½+7½¢
Cincinnati	3.75	3.45	3.50+7½¢d	3.225/3.475	3.50	3.67+44¢hi	3.65+91¢e	2.50	2.40
Cleveland	3.715+10¢	3.74	3.64+10¢d	3.74	3.74	3.765	3.64+10¢d	3.00	2.915
Dallas	3.775	3.10	3.225+7½¢d	3.20/3.25	3.561½+10¢f	3.25+7½¢e	3.25+81¢f	1.62½	1.62½
Denver	3.78	3.25	3.175+7½¢d	3.05	3.375+12½¢hi	3.40	3.55+10¢D	2.17	2.17
Detroit	3.53+39¢ff	3.25+40¢e	3.60+22½¢f	3.20+20¢h	3.58+34¢f	3.65+34½¢C	3.63+14¢B	2.58+25¢e	2.58+25¢e
Kansas City	3.85	3.325	3.40	3.345	3.625	3.47+16D	3.40+9¢ff	2.355	2.405
Los Angeles	3.80+10¢hh	3.375+20¢e	3.625+10½¢e	3.41+10¢d	3.94+15¢d	3.90f	3.70+28½¢	2.68+10¢e	2.68+10¢e
Minneapolis	3.725	3.30	3.47R	3.25	3.40+23¢d	3.38+36¢e	3.215+20¢e	2.55	2.55
New Orleans	3.425+5¢e	2.90	3.25+7½¢d	3.025+7½¢d	2.985+5¢e	3.375+7½¢f	3.25+15¢e	1.70	1.65
New York	4.25+37¢ee	4.00+32¢hj	4.30+36¢e	4.25+34¢ii	4.15+52¢d	3.90+43½¢ef	4.20+42¢kL	2.90+23.2¢F	2.90+23.2¢F
Philadelphia	4.00+17¢i	3.635	4.05+18¢ff	4.095+10¢e	3.90+15¢f	4.07½+16¢e	4.00+11½¢R	2.35	2.65
Pittsburgh	3.95+17½¢m	3.525+7½¢	3.80+10¢d	3.64+10¢d	3.575+17½¢m	4.00+28¢d	3.775+17½¢m	2.325+17½¢m	2.30+20¢fff
St. Louis	3.90+31½¢	3.575+10¢e	3.60+7½¢d	3.675e	3.80+7½¢f	3.83+20¢e	3.80+20¢d	2.625+10¢d	2.625+10¢d
San Francisco	3.95+52½¢dd	3.175+30¢f	3.621+10¢d	3.405+10¢d	3.60+30¢eR	3.785+26¢fU	3.70+46¢fK	2.685+10¢d	2.685+10¢d
Seattle	3.75+10¢d	3.13+10¢d	3.40+10¢d	3.20+20¢e	3.40+10¢d	3.40+21½¢K	3.62+23¢T	2.70+10¢d	2.7p+10¢d
Montreal	2.20+5¢jj	2.10+5¢jj	2.25+5¢jj	2.00+5¢jj	2.35+5¢jj	2.20+5¢jj	2.32+5¢jj	1.50+3¢jj	1.50+3¢jj
Toronto	2.76+11¢f	2.50+10¢f	2.55+7¢f	2.60+10¢f	2.60+20¢ff	2.80+11¢ff	2.69+17¢ff	1.55+6¢f	1.55+6¢f

ENR Skilled Average (Bricklayers, Carpenters, Iron workers): $3.638. ENR Common Average $2.309.

* Cost of living bonus incl. in base pay. *a 6 hr day. *b 7 hr. day. *c 5% vac. stamp fund plus 10¢ WF for bricklayers; 4% VF for electricians plus 8¢ WF, 1% PF. *d H & WF. *e 10¢ H & W, 10¢ VF. *f 10¢ H & W, 10¢ PF, 10¢ VF. *g $2.85 homes & housing plus 7½¢ WF. *h WF. *i Inc. 4% VF; 1% PF pd by employer. *k 10¢ WF, 5¢ VP, 5¢ HP. *l 4% VF. *m 7½¢ WF, 10¢ PF. *n 7% V & Hol., 3% H & W, 1% PF. *o 10¢ WF, 10¢ PF. *p 3% WF, 3% PF +10¢ in lieu of pd. hol. *q 10¢ WF, 6% V & H, 3% PF. *r 4% WF, 20¢ PF. *s 5% W & PF, 4% VF, 1% NC, 1% JI, plus 6 PH. *t Inc. 10¢ WF. *u 10¢ WF, 1% PF, 1% apprent. *v 1 drum; 2 drums, 2.80. *w 15¢ WF, 15¢ VF. *x 20% VF. *y 10¢ H & W, 10¢ PF. *z 10¢ WF, 5¢ HP. *A 15¢ WF, 15¢ PF, 20¢ BF. *B 7½¢ VP, 5¢ PF 1½¢ Ed. F. *C 9¢ H & W & Ins., 7% V & H. *D 10¢ H & WF, 5¢ Indus. prom. *E 6% WF, plus travel pay per day. *F Plus $4 per day annulty contrib. *G 10¢ WF, 10¢ VF, 3¢ prom. *H 10¢ WF, 10¢ VP, 3% PF, 2% PH. *I 15¢ H & WF, 5¢ advig. *J 5% WF, 6 PH, 3% PF. *K 25¢ W & PF, 15¢ VF, plus 6¢ misc. *L 3% WF, 3% PF, 3% VF, 1% Ed. F. *M 10½¢ WF, 7½¢ PF. *N 1% PF. *O 10¢ WF, 1% NECA, 3¢ AF. *P 10¢ H Ins., 7½¢ PF, 5¢ VF. *Q 2 drums; 1 drum $2.85/3.00 + 10¢ WF *R 10¢ H & WF, 2¢ admin. 1¢ apprent. *S 10¢ H & WF, 15¢ PF. *T H & W, VF. *U 10¢ WF, 13¢ VF, 3¢ PF. *V 4% WF, 4% PF. *W 7½¢ WF, 1½¢ Ed. F. *X 7½¢ WF, 14¢ VF. *aa 7¢ WF, 15¢ PF. *bb 8¢ WF, 2¢ advg. *dd 17½¢ WF, 20¢ PF, 10¢ PH, 5¢ Jt Bd. *ff 10¢ H & W, 5¢ PF. *gg 10¢ ins. *hh 7½¢ H & WF, 5¢ Indus. prom *ii 4% WF, 4% PF, 6 PH. *jj 2%VF

	Truck drivers 1½ T	under 4 cy	over 4 cy	Tractor Operators Incl. bulldozers 34-49 hp	70-100 hp	100 & over	Tractor scraper 15-18 cy	Power cranes & shovels ½ cy	¾ cy	Motor grader oper	Air comp oper	Air tool oper
Atlanta	$1.70	$1.80	$2.05	$2.70	$2.70	$2.70	$2.70	$3.225	$3.225	$2.70	$2.475	$1.77
Baltimore	2.00+7½¢e	2.00+7½¢e	2.10+7½¢hh	3.40/3.55 +10¢ab	3.40/3.55 +10¢ab	3.40/3.55 +10¢b	3.40/3.55 +10¢b	3.80/3.95 +10¢ab	3.80/3.95 +10¢ab	3.40/3.55 +10¢ab	2.85/3.00 +10¢ab	2.10+7½¢e
Birmingham	1.73	1.92ff	2.25ee	2.70	2.70	2.70	2.93	2.93	2.93	2.80	2.52	1.90
Boston	2.295c	.....	.....	3.40+10¢ed	3.40+10¢ed	3.40+10¢ed	3.40+10¢ed	3.775+10¢e	3.775+10¢e	3.40+10¢e	3.325+10¢e	2.60+7¢ee
Chicago	2.36+15¢fb	.....	.....	3.15+5¢e	3.20+5¢e	3.20+5¢e	3.00+5¢e	3.75+5¢e	3.75+5¢e	3.25+5¢e	3.10+5¢e	.....
Cincinnati	2.33+2½¢ee	2.43+2½¢ee	2.53+2½¢ee	3.225	3.225	3.225	3.225	3.475	3.475	3.475	3.475	3.475
Cleveland	2.75+10¢e	2.75+10¢e	2.75+10¢e	3.49	3.49	3.49	3.49	3.74	3.74	3.49	3.365	3.365
Dallas	1.625	1.625	1.625/2.625f	1.625/2.625f	1.625/2.625f	1.625/2.625f	1.625/2.625f	1.625/2.625f	1.625/2.625f	1.625/2.625f	1.625/2.625Rf	1.775/2.00f
Denver	2.30	2.40	2.55	2.30	2.90	2.90	2.90	3.05	3.05	2.90	2.90	2.45
Detroit	2.61	2.61	2.61	3.50+10¢e	3.50+10¢e	3.50+10¢e	3.50+10¢e	3.50+10¢e	3.50+10¢e	3.50+10¢e	3.225+10¢e	2.71+25¢eee
Kansas City	2.33e	2.33e	2.405e	2.65	3.10e	3.10e	3.10e	3.345	3.345	3.10	3.345f	2.45
Los Angeles	2.83+10¢e	2.83+10¢e	3.03+10¢e	3.71+10¢e	3.71+10¢e	3.71+10¢e	3.81+10¢e	3.81+10¢e	3.81+10¢e	3.81+10¢e	2.93+10¢e	2.89+10¢e
Minneapolis	2.55	2.55e	2.70e	2.93	3.15e	.....	3.15	3.37e	3.63e	2.93	2.82	2.70R
New Orleans	1.80	2.05	2.05	2.375+7½¢e	3.025+7½¢e	3.025+7½¢e	3.025+7½¢e	3.025+7½¢e	3.025+7½¢e	3.025+7½¢e	2.375+7½¢e	1.75
New York	2.21+22½¢	2.75+14¢hh	2.75+14¢hh	3.625+20¢h	3.625+20¢h	3.625+29¢h	3.75+30¢h	4.50+36¢h	4.50+36¢h	3.75+30¢h	3.75+30¢hf	3.35+27¢ee
Philadelphia	—2.315/2.45+12½¢—			—3.34/4.09½+10¢—			3.34/4.09½ +10¢e	—3.02½/3.95½+10¢—		3.34/4.09½ +10¢e	3.34/4.095+10¢e	2.35+15¢e
Pittsburgh	2.37+20¢m	2.51+20¢m	2.61+20¢m	3.44+10¢e	3.44+10¢e	3.44+10¢e	3.44+10¢e	3.64+10¢e	3.64+10¢e	3.64+10¢e	3.15+10¢e	2.30+20¢m
St. Louis	2.65+7½¢ee	2.70+7½¢e	2.70+7½¢e	3.675hh	3.675hh	3.675hh	3.675hh	3.675hh	3.675hh	3.675hh	3.125hh	3.125hh
San Francisco	2.75+10¢e	2.75+10¢e	2.89+10¢e	3.52+10¢e	3.52+10¢e	3.52+10¢e	3.52+10¢e	3.85+10¢e	3.85+10¢e	3.68+10¢e	3.13+10¢e	2.955+10¢e
Seattle	2.87+17½¢ee	2.87+17½¢ddz	3.07+17½¢ee	3.26+20¢ee	3.26+20¢ee	3.26+20¢ee	3.26+20¢ee	3.63+20¢ee	3.63+20¢ee	3.35+20¢ee	2.99+20¢ee	2.90+10¢e
Montreal	1.50+3¢jj	1.50+3¢jj	1.50+3¢jj	1.70+4¢jj	1.93+4¢jj	1.93+4¢jj	1.93+4¢jj	2.19+5¢jj	2.19+5¢jj	1.93+4¢jj	1.80+4¢jj	1.80+4¢jj
Toronto	1.60+6¢ff	1.60+6¢ff	1.60+6¢ff	2.00+8¢ff	2.10+8¢ff	2.10+8¢ff	2.10+8¢ff	2.60+10¢ff	2.60+10¢ff	2.10+8¢ii	2.15+9¢ff	2.15+9¢ff

*a H & WF. *b lower rates, straight time; other broken. *c 2-axle; 10 wh. 3 axle $2.45; Euclid $2.65. *d intermediate. *e bldg contr.; highway $2.45+7¢ WF. *f less than 2-T. *g up 6 cy. *h 4% WF, 4% PF. *i 6-8 cy. *j plus $2 pd by employer for hosp. death benefits to family. *k bldg constr; steel contr $3.475. *l higher rates are union, other taken from min. wage approved by County Comm. Court. *m 10¢ H & W, 5¢ PF. *n flatbed. *o under 10 cy. *p over 10 cy. *q over 50 hp. *r blade grader. *s WF. *t single. *u incl. 10¢ H & W. *v 7½¢ H & W. 5¢ PF. *x 7½¢ WF, 10¢ PF. *y to 3½ cy. *z 3½ cy & over. *aa plus W & PF. *bb 3% WF, 2% PF; plus 11 PH. *cc 11¢ WF, 11½¢ PF, 11 PH. *dd up to 5 cy. *ee 5 cy & over. *ff 1½ to 3 T. *gg up to 5 T; 5 T & over, 2.25. *hh 5¢ H & WF ,2½¢ PF. *ii 4% VF *kk Incl. 10¢ WF. *ll Incl. 2% VF. *mm 10¢ H & WF, 10¢ ins, 5¢ VP. *oo Plus $2.25 wk. WF. *ss 5% WF, plus 6 PH. *tt 10¢ H & WF, 10¢ PF. *R revised

MEXICO CITY PRICES

Pesos, F.o.b. City		Apr. '58	May '58
Common Wages—Building (8 hr. day) (Pesos)	av. per hr.	1.57	1.57
Common Wages—Heavy Const. (8 hr. day) (Pesos)	av. per hr.	2.00	2.00
Skilled Labor Wages			
Carpenters (8 hr. day) 1 cl.	av. per hr.	3.25	3.25
Bricklayers (8 hr. day) 1 cl.	av. per hr.	2.87	2.87
Struct. Iron Workers (8 hr. day)			
Remachadores.	av. per hr.	4.38	4.38

Struct. Steel, Shapes		Apr. '58	May '58
3"-15" x 12 meters	per metric ton	2300.00f	1804.00f
f.o.b Monterrey			
Reinf. Steel, Corrugated Rods			
⅜" x 11 meters	per ton	2100.00	1800.00
½" x 11 meters	per ton	2100.00	1800.00
⅝" x 11 meters	per ton	2000.00	1750.00
¾" x 11 meters	per ton	2000.00	1750.00
⅞" x 11 meters	per ton	2000.00	1750.00
1" x 11 meters	per ton	2000.00	1750.00

Gravel truck load at 3½ cu. meters		Apr. '58	May '58
Blue Gravel	per tr. load	75.00	84.00
Rose Gravel	per tr. load	65.00	65.00
Cement, Std. Port. (Tolteca).	per tan	240.00	230.00
Lumber			
1" Pine	per M ft.	1700.00	1700.00
1½" Pine	per M ft.	1900.00	1900.00

Materials and Labor Prices

Monthly Market Quotations by ENR Field Reporters

See following ENR issues for OTHER PRICES

- Cement, Aggregate Ready-mixed Concrete, Asphalt: Last, May 15; Next, Jun. 5
- Iron and Steel Products, pipe: Last, May 15; Next, Jun. 12
- Wage Rates, Building Board, Lath, Insulation: Last, Apr. 3; Next, Jul. 3
- Wood Products, Glass, Explosives, Chemicals: Last, May 22; Next, Jun. 19

STRUCTURAL CLAY BUILDING TILE, BRICK AND LIME—DELIVERED

	STRUCTURAL CLAY TILE PARTITION — SCORED Per M. lots of 2,000 pieces or over,			STRUCTURAL CLAY TILE — LOAD BEARING — SCORED Per M. lots of 2,000 pieces or over,			BRICK Per M. in quantity		LIME Per ton, in paper, Carload lot,		
	3x12x12 in.	4x12x12 in.	8x12x12 in.	8x12x12 in.	10x12x12 in.	12x12x12 in.	Common backing	Straight hard	Hydrated finishing	Common hydrated	Pulverized or lump
Atlanta	$149.90p	$149.90p	$299.80p	$334.55p	.....	.....	$30.50p	$32.70p	$23.50	$24.50	$.....
Baltimore	217.00	231.00	434.00	491.00	602.00	690.00	36.00k	41.00k	35.60	23.20	.....
Birmingham	135.00p	152.00p	.....	303.00p	376.00p	485.00p	27.00ff	38.00g	35.00	22.30	26.33g
Boston	222.00†	248.00†	463.25†	556.00†	.....	.....	41.50p	46.50p	39.20†	31.20†	.....
Chicago	135.00	145.00	280.00	.....	.....	.....	30.00	32.00	35.00	35.20o	.....
Cincinnati	205.00j	225.00j	206.00jdd	213.00j	288.00j	314.00j	48.75j	47.00j	30.04j	26.04j	30.04j
Cleveland	209.00	223.00	.....	475.00	.....	.....	38.00	46.00gg	31.00	25.00	.....
Dallas	152.00	152.00	300.00	364.50	446.25	582.80	26.75	48.00	41.80	24.58	28.50
Denver	.....	.....	.....	.....	.....	.....	21.50	49.50	46.00p	42.00p	48.00p
Detroit	273.00	298.00	545.00	.....	794.00	906.00	47.50p	48.00p	38.00	34.00	.....
Kansas City	158.00	158.00	312.00	312.00	400.00	500.00	33.00	33.00	36.26	34.26	29.76
Los Angeles	r	r	r	r	r	r	32.50§	.....	38.00	38.00	39.00
Minneapolis	192.00p	215.00p	427.00p	215.00pu	.....	.....	45.60rp	54.00y	47.00bbc	37.00bbc	49.00bbds
Montreal	170.00su	178.00su	335.00sus	270.00q	400.00q	.....	48.25b	56.30b	39.00	22.00	13.25
New Orleans	186.00	186.00	380.00	380.00	.....	.....	42.00	55.00	44.00	33.00	33.00P
New York	175.30h	187.00h	280.40eh	263.00hn	.....	.....	44.00	.....	38.00	35.00	.....
Philadelphia	160.00	180.20	337.90	405.00	.....	.....	30/34	38/42	27.00	25.00	3.17m
Pittsburgh	147.50t	157.75t	295.00t	335.00t	435.00t	500.00t	39.00t	46.00t	36.00t	31.00t	.....
St. Louis	178.50p	185.00p	391.00p	401.00p	459.00	621.80	43.00l	41.50	0.95ss	.80ss	1.35su
San Francisco	158.55°	177.10°	235.30ddl°	.....	.....	.....	43.00°	43.00°	28.90	28.90	31.00 °
Seattle	235.00p	270.00p	490.00p	265.00pu	.....	.....	48.00	62.00	52.00bb	38.00bb	4.50mbb
Toronto	146.00	157.00	289.00	234.00f	395.00	.....	35.00	63.00	36.00	33.50	31.50

°§ F.o.b. Yard. °° F.o.b. plant Stockton. °† F.o.b. yard Roxbury. °a Smooth. °b $4.50 del. °c 8 x 12 x 12 in.-3 cell. °d Pulverized hot. °e 8%, 10th following month. °f 8 x 8 x 12. °g Lumps, $26.72. °h F.o.b. trucks, job site N.Y.C. °i 60 lb sacks. °j Truck load or over. °k $1.00 discount. °l Red face. °m Per bbl., 180 lb. processed. °n 7¼ x 7¼ x 12. °o Mason's double hydrated pressure. °p Truck lots. °q Provincial and Municipal tax extra. °r Not used; earthquake danger. °s 8 x 16 x 12. °t 2% cash. °u Incl. Federal tax. °v Sand lime. °w 5 x 8 x 12. °x Chi common. °z Pebble; 80 lb sack. °aa 50 lb sack. °bb LCL. °dd 8 x 12 x 12. °ff 80% common. °gg Smooth. $31.50 Rough.

PAINT, ROOFING—F.O.B. CARLOAD LOTS

	RED LEAD Per 100 lb. in 600-lb. (Approx.) bbl.	WHITE LEAD Per 100 lb. in 100 lb. cases	READY-MIXED PAINT Per gal., drums			ROOFING SUPPLIES; Carload lots f.o.b. factory			
	Dry a	In oil w	Graphite b	Aluminum c	Ferric Oxide d	Rolls, slate surfaced, 85-90 lb. per sq.	Asphalt felt, per 100 lb.	Tar felt, per 100 lb.	Asphalt coating per gal.	Tar pitch 200 lb. bbl. per ton
Atlanta	$16.50	$30.125	$3.59	$3.86	$3.31	$3.39	$2.20	$2.62	$0.17	$57.75
Baltimore	16.25	29.75	3.00	4.40	3.50	2.78	4.25	4.25	.48	54.25
Birmingham	16.50	30.125	3.90	3.40	....	3.00	2.20ii	2.20ii	.52ff	45.00ss
Boston	16.25	29.75	....	....	....	3.30g g	2.25g	2.23g	.50g	58.00g
Chicago	16.25	29.75	....	....	....	3.65ju	2.74ju	2.98ju	45.00ddu	67.70ju
Cincinnati	16.25	29.75	....	....	....	3.13	2.70	2.73	.428y	55.96
Cleveland	16.25	29.75	2.55pp	2.50ppR	2.92pp	2.77q	2.02q	2.85	.501y	49.00gg
Dallas	16.50	30.50	....	3.20B	....	3.00u	3.00u	3.00u	.470	66.00hh
Denver	16.75	30.25	3.98	5.20	3.70	2.49	1.90u	2.45u	.48ff	50.00
Detroit	16.25	29.75	2.70	3.95	2.70	2.83	1.91f	2.49f	.431f	51.00
Kansas City	16.25	30.50	3.99	3.43	3.01	2.72ii	1.82o	1.82o	.54y	.....
Los Angeles	16.25	30.00	3.30n	4.50n	4.20n	3.30n	2.15nii	i	.70ny	i
Minneapolis	16.25	29.88/29.75	....	....	....	3.29	2.45hi	2.42hi	.442i	50.00r
Montreal	.....	.....	5.02Dfi	5.94zfi	4.65ifi	5.40	4.65f	4.65f	1.60	....
New Orleans	....	.....	....	....	....	2.34	1.63	2.85	0.680	.....
New York	16.25C	29.75	....	....	....	3.20	2.16o	2.45o	.425s	49.00°
Philadelphia	16.25	29.75	3.60	3.40/3.65	3.50/4.60	3.00/3.50	2.54o	2.54o	.37/.45	48/54
Pittsburgh	16.25	29.75	2.20tE	2.25tF	2.25tG	3.37s	2.59s	.....	.45	.....
St. Louis	16.25	29.75	....	....	....	3.40iis	2.54hh	2.85hh	.44y	62.00
San Francisco	16.25	30.00	3.45	4.50	3.50	2.85	1.97aa	3.10	.475jj	54.00
Seattle	16.25	30.25	3.47	4.19ac	....	3.82acc	3.30hcc	.....	.50cc	51.40ac
Toronto	.....	.....	5.00	5.75	5.50	3.40	4.15o	2.95o	1.70j	56.00A

°† Delivered. ° Note: Red lead in oil 50% higher than white lead in oil. °° Aver. wt. approx. 425 to 550 lb drums. °a Red lead prices change frequently due to pig lead price changes. °b U.S. War Dept. Spec. 3-49A. °c ASTM Spec. D266-31. °d 80% minimum ferric oxide. °e 15 lbs. °f Per 432 sq ft. °g F.o.b. yard, Roxbury. °h Per roll, 65 lb. °i Net carload prices, Minneapolis and vicinity. °j 45 gal containers. °k Over 80% ferric oxide. °l Not used. °n F.o.b. city. °o Per 60 lb roll. °p 8-drum, 50 gal each. °q Per 90-lb roll. °r F.o.b. factory, Chicago. °s Truckload. °t Incl. Federal tax. °u Per 90-lb square. °v Per ton. °w Price to contractors $1.25 less. °x Ready-mixed. °y 55-gal container. °z Drums. °aa 15 lb. sq ft. °bb Roofers coating and cement. °cc LCL, truck delivery. °ee Asphalt pitch in 100 lb package. °ff 5-gal drums. °gg F.o.b. factory. °hh Incl. freight. °ii Per roll. °jj Asbestos roof coating. °A 400 lb barrels. °B ASTM Spec. D962-49. °C 95%. °D Std. black. °‡ Milit. spec.: E TTP27; F TTV81; G TTP31. °H Not quoted after Oct. 1957 °R revised.

PLASTER, VERMICULITE AND METAL BUILDING SHEETS & TUBING

	PLASTER‡		VERMICULITE‡		PERLITE‡		ALUMINUM SHEETh†		STAINLESS STEEL† SHEET-TYPE 302g		COPPER WATER* TUBING-TYPE L 2000 ft lots per ft	
	Neat per ton	Gauging per ton	Home Insulation pellets	Plaster aggregate	Concrete Aggregate Untreated	Plaster Aggregate	Concrete Aggregate Untreated	Flat .102" th 36"x96" & 48"x144" per lb/pt	Corr roof .032" th 35"x12' per sht	20 ga 48"x96-120" per cwt/bh	26 ga 36"x120" per cwt/mm	½"b	⅝"e
			per bag of 4 cu ft										
Atlanta	$31.00	$36.00	$1.55s	$1.65s	$1.80al	$1.65	$1.65	$0.422n	$8.97n	$61.44n	$67.50	$16.74f	$23.41f
Baltimore	23.80	34.60	0.95	1.15	1.15	1.15	1.65	0.431	0.489r	56.25	64.25	0.1674	0.2341
Birmingham	33.00	39.00	1.55	1.55	1.80l	1.55	1.55l	0.446	10.48	67.34	76.09	0.1608	0.2244
Boston	22.00	30.00	1.40	1.40	1.45	1.45	1.50	0.466	30.10p	65.42dd	71.92ddff	0.1562	0.2176
Chicago	26.80	26.80	1.55	1.60	1.60l	1.60	1.60	0.506z	10.376a	65.15aee	73.90aee ¶	0.1562	0.2176
Cincinnati	28.00°	28.00°	1.75	1.75	1.75	1.85	1.90	0.434	9.56	65.28	74.03ff	0.1608	0.2244
Cleveland	28.00	44.70	1.13k	1.16ii	1.24l	1.45	1.45	0.486aa	8.28	65.33oo	74.08oo	15.62f	21.76f
Dallas	30.65	32.65	1.06	1.21	1.32	1.21	1.32	0.474	0.510r	67.00	80.75	0.1520	0.2170
Denver	25.00	25.00	1.50	1.40	1.50	1.40	1.55	0.446	10.09	66.30gg	75.05gg	0.1772	24.69
Detroit	26.00	25.00	1.28	1.32	1.41	1.54	1.28k	0.456a	10.376a	65.15a	73.90a	14.02f	19.00f
Kansas City	30.00	35.00	1.14	1.18	1.26l	1.18	....	0.444	11.40	67.50	76.25	15.62f	21.76f
Los Angeles	27.00	28.00	1.25k	1.20k	1.25	1.00	1.10	0.486	10.543d	67.10	75.85	0.1562	0.2176
Minneapolis	35.00	35.00	1.55	1.70	1.80	1.40	1.40	0.483	15.15w	65.71	72.21ff	0.1562f	0.2176f
Montreal	27.60h	35.60h	1.20	1.40	1.50	1.15s	1.15s	0.437	9.92	66.50	.....	0.1827	0.2160
New Orleans	34.00	48.00	1.25	1.25	1.25	1.25	1.25	0.424	8.593	71.50	72.45	0.1608	0.2244
New York	24.20	30.20	1.35	1.30	1.50	1.40	1.40	0.506a	10.14ad	68.58	77.33	16.08f	22.44f
Philadelphia	23/25	32.00	1.35	1.35	1.40l	1.05	1.05	0.44aw	9.46a	66/68a	75/77a	15.62f	21.76f
Pittsburgh	30.00nn	33.00nn	1.60nn	1.50nn	1.35	1.73	1.73	0.424	9.664	64.00	76.25ppR	0.1378	0.1920
St. Louis	29.00	40.00	1.35	1.60ff	1.50	1.60	1.60	0.456	10.37	68.11	74.61y	15.62fm	21.76fm
San Francisco	27.85	32.00	1.20	1.20	1.30	1.20p	1.30p	0.506	9.13	67.10	75.85	0.1562	.2176
Seattle	42.40	45.60	1.55	1.25k	1.85l	1.50k	....	0.506	10.10	67.08	88.08	0.1562	0.2176
Toronto	28.00	45.50	1.20	1.30	1.45l	....	1.55	0.3995	24.00as	73.74	86.52	0.2525	0.2684p

‡trucklots, delivered †fob warehouse *fob city °a delivered °b½" O.D. °c ⅝" O.D. °d 0.100"th °e 34" x 80" sheet °f per 100 ft °g 5 tons & up; cold roll, anneal & pickled; 2B finish °h incl. Federal tax °i add 25¢ for pint of additive °j 1100 & 3003 alloy, mill finish °k bag of 3 cu ft °l treated with air entraining agent °m 2-10M ft °n fob mill, fr allow °o 250 sacks or more °p 100 sq ft °r per lb. °s 30 lb bag °t 36" x 96;-10.81 lb/sh; 48" x 144"; 21.7 lb/sh °u 19.31 lb/sh °v fob plant °w 48" x 144" °x 100th °y 27 gauge °aa 16M lb & up °dd add $1.00 cwt boxing. °ee 4 tons & up °ff 26 ga °gg add $2/cwt boxing; $0.75/cwt on skids °hh Theoretical wt for 48" x 96"; 60.4-lb, per sh. °ii 300-bag lots °jj 100-lb bag °mm Theoretical wt; 19.7-lb per sh. °nn 2% cash °oo skid packed °pp type 304 °R revised.

Construction Reports

Bids Asked—Low Bidders—Contracts Awarded—

Compiled by Business News Department—Engineering News-Record, 330 W. 42nd St., New York 36, N. Y., ELSIE EAVES, Manager
J. A. MAHONEY, M. WETZEL, M. E. SCIORRA, D. TARTAGLIA, Reports
J. H. WEBBER, M. R. ROESSLER, E. R. HUBER, Statistics.

NEW ENGLAND

HEAVY CONSTRUCTION—BA

STATE HIGHWAY LETTINGS
STREETS AND ROADS
June 2, 9 Connecticut — June 3 Massachusetts

BUILDINGS—BA

▲ **Conn., Hartford**—HOSPITAL ADDN.—BA 6/5—St. Francis Hospital, 114 Woodland St., 4 story, buff limestone hospital wing, incl. medical library, altering existing bldgs. $3,000,000. York & Sawyer, 101 Park Ave., New York, N. Y., archts. Kiff, Colean, Voss & Souder, 101 Park Ave., New York, assoc. archts. Jansen & Rogan, 500 Fifth Ave., New York, N. Y., consult. engrs. CD 3/13.

▲† **Mass., Chicopee Falls**—HOUSING—BA 6/12—Procurement Officer, Westover Air Force Base, Chicopee Falls, 310 units Capehart housing at Westover Air Force Base. $5,000,000. CD 3/21.

HEAVY CONSTRUCTION—LB & CA

▲ **MASSACHUSETTS**—Commonwealth of Mass., Dpt. P. Wks., 100 Nashua St., Boston, Bids opened 5/20,
Bayer & Mingolla Constr. Co. Inc., P. O. Box 991, Worcester, Mass. LB **$3,361,958**, est. $4,107,391, hy. and bridge constr. Rte. 28, Wilmington, Tewksbury and Andover. CD 5/6.

▲ **MASSACHUSETTS**—Commonwealth of Mass., Dpt. P. Wks., 100 Nashua St., Boston,
Lawrence & Henley Lundgren, 193 Hartford Pike, Shrewsbury, Mass., CA **$3,094,893**, est. $3,950,170, hy. and bridge constr. Rte. 116-F-163 (5), Amherst and Hadley. Bids Apr. 29. CD 5/2, under LB.

▲ **MASSACHUSETTS**—Commonwealth of Mass., Dpt. P. Wks., 100 Nashua St., Boston, Bids opened 5/13,
J. F. White Contg. Co., Box 358, Westwood, Mass., CA **$3,987,000**, est. $4,375,408, relocation Section Rte. 28, incl. 5 bridges, F 359 (2), Middleboro. Bids Apr. 22 CD 4/24, under LB.

▲† **Blount Brothers Constr. Co.**, 79 Commerce St., Montgomery, Ala., CA **$8,560,445**, est. $8,858,079, BOMARC missile launching site, Otis Air Force Base, ENG-19-016-58-127, FALMOUTH, MASS. U.S. Eng., 150 Causeway St., Boston, Mass. Bids May 7. CD 5/12, under LB.

▲ **CONNECTICUT**—State Hy. Dpt., 165 Capitol Ave., Hartford,
L. G. DeFelice & Son, Inc., Nettleton, Ave., North Haven, Conn. LB **$4,145,212**, est. $5,800,000 (12 bidders), 15,720 lin. ft. c. conc. pavement on relocation of Route No. 9, incl. 5 grade separation structure, Tyron St. to Canel Rd., Contr. 82-106, town of Middletown. Bids May 19. CD 4/30.

MIDDLE ATLANTIC

HEAVY CONSTRUCTION—BA

STATE HIGHWAY LETTINGS
BRIDGES
June 10 New Jersey
STREETS AND ROADS
June 3, 10 New Jersey — June 13 Pennsylvania

▲ **NEW YORK**—BA 6/17—Triborough Bridge & Tunnel Auth., Administration Bldg., Randall's Island, New York, Zone 35,
Throgs Neck Bridge Contr. No. TN-10A, Bronx Approach substructure.
Throgs Neck Bridge Contr. No. TN-10B, Queens Approach substructure. Plans deposit $30. CD 1/20/55.

▲ **NEW YORK**—BA 6/18—Triborough Bridge & Tunnel Auth., Administration Bldg., Randall's Island, New York, Zone 35,
Throgs Neck Bridge Contr. No. TN-10C, Bronx Approach superstructure steel.
Throgs Neck Bridge Contr. No. TN-10D, Queens Approach superstructure steel. Plans deposit $30. CD 1/20/55.

BUILDINGS—SLC

▲ **Pa., Pittsburgh**—GARAGE—Equitable Life Assurance Society of U. S., 393 7th Ave., New York, N. Y. and Bldg. No. 3, Gateway, Pittsburgh, soon lets contract underground parking garage $2,500,000. Schell & Deeter Bldg. No. 3, Gateway, Pittsburgh, archts. Praeger-Kavanagh, 126 E. 38th St., New York, N. Y. engrs. CD 7/25/55.

HEAVY CONSTRUCTION—LB & CA

▲ **Gull Contrg. Co., Inc.** and **L. G. DeFelice & Son, Inc.**, 33-15 Lawrence, Flushing, L. I., New York, (jointly) LB **$29,861,840** (6 bidders), Section No. 3, waterways and appurtenant work for Niagara Power Proj. in Lewiston and Niagara, Niagara Co. Contr. M-7, NEW YORK. Power Authority of State of New York, The Coliseum Tower, 10 Columbus Circle, New York 19, N. Y. Bids May 20. CD 3/24.

▲† **George M. Brewster & Son**, 275 Ft. Lee Rd., Bogota, N. J., LB **$4,152,265** (3 bidders) apron and taxiway support facilities Griffiss Air Force Base ENG-30-075-58-209, ROME, N. Y. U. S. Eng., 111 E. 16th St., New York 3, N. Y. Bids May 15. CD 5/13.

▲ **NEW JERSEY**—State Hy. Dpt., Kenneth D. Rice, secy., 1035 Parkway Ave., Trenton. Bids opened 5/13,
George M. Brewster & Son, 275 W. Fort Lee Rd., Bogota, N. J., LB **$6,653,908**, (7 bidders), grading, paving and bridges, 3.985 mi. Rte. 101 Sect. 2C, from Howard Blvd. (Mt. Arlington Road), to Rte. 15 (Union Turnpike), Twps. of Rockaway, Jefferson and Roxbury, and Boroughs of Wharton and Mt. Arlington, Fed. Proj. No. I-101-2 (9), Morris Co. CD 4/21.

BUILDINGS—LB & CA

▲† **James J. Waters Corp.**, 415 Lexington Ave., New York 17, N. Y., LB **$3,827,100** (10 bidders), 238 units permanent Capehart Family HOUSING at Fort Jay, Governors Island, ENG-30-075-58-273, FORT JAY, N. Y. U. S. Eng., 111 E. 16 St., New York 3, N. Y. Bids May 20. CD 4/18.

▲† **Girdler Constr. Div. Chemetron Corp.**, 224 E. Broadway, Louisville, Ky., CA Est. **$45,000,000** design and construct PLANT to supply hydrogen for high energy fuel at Lake Ontario Ordnance Works for Department of Air Force, MODEL CITY, N. Y. Olin Mathieson Chemical Corp., 460 Park Ave., New York 22, N. Y. CD 8/26/56.

▲ **Cauldwell-Wingate Co.**, 101 Park Ave., New York 17, N. Y., CA **$7,546,000**, general contract, City and Municipal COURTS BUILDING, Manhattan Boro, NEW YORK, N. Y. City, Dpt. P. Wks., Municipal Bldg., New York 7, N. Y. Bids Apr. 16. CD 3/21, under LB.

▲ **Diesel Constr. Co.**, 24 W. 48th St., New York, N. Y., CA Est. **$14,000,000**, 14 story, 300,000 sq. ft. OFFICE, West Broadway, Park Pl., Greenwich and Barclay Sts., NEW YORK, N. Y. Erwin S. Wolfson, 24 W. 48th St., New York, N. Y. William Lascaze, 211 E. 48th St., New York, N. Y., archt.

▲ **Stuart Constr. Co.**, Rte. 70, Marlton, N. J., Own Forces, **$6,000,000**, 500 HOUSES forming Heritage Village, off Rte. 70, MARLTON, N. J.

▲ **Joseph Einhorn**, Nuko Terrace, Mount Freedom, N. J., Own Forces, **$8,000,000**, 537 HOMES, Mount Hope Ave. and Rte. 101, Rockaway Twp., MOUNT HOPE, N. J.

▲ **Sordoni Constr. Co.**, 45 Owen St., Forty Fort, Wilkes-Barre, Pa. LB **$2,922,000** general constr. 2 patient WARD BLDGS. for Wernersville State Hospital, WERNERSVILLE, PA. General State Auth., 18th and Herr Sts., Harrisburg, Pa. Bids May 14. CD 4/29;
Corbit's, Inc., 225 S. Front St., Reading, Pa. LB **$365,900** interior heating and ventilating (Wernersville, Pa.).

▲ **Shapiro, Inc.**, 1413 K St. N. W., Wash., D. C., CA Est. **$2,500,000**, 8 story, APARTMENT, 2700 Adams Mill Rd. N. W., WASH., D. C. J. B. and Morris Shapiro, 1413 K St. N. W., Wash., D. C. George T. Santmeyers, 7240 Wisconson Ave., Bethesda, Md., archts. William H. Shoemaker, 927 51 St. N. W., Wash., D. C., archt.

▲† **Terminal Constr. Co.**, State Hy. 17 and Monachie Ave., Wood-Ridge, N. J. and **Frouge Constr. Co., Inc.**, 141 North Ave., Bridgeport, Conn., CA **$8,097,756**, 500-unit Capehart HOUSING, Dover Air Force Base, ENG-11-626-58-4, Ch, DOVER, DEL. Procurement Officer, Base Theatre, Dover Air Force Base, Dover, Del. Bids May 1. CD 5/14, under LB.

PROJECTS COVERED

By Size

Construction projects here reported cover the United States and Canada, are of these minimum sizes or larger: water supply, earthwork, waterways $44,000; other public works $73,000; industrial buildings $93,000; other buildings $344,000. Also Foreign projects of $100,000 and more in size of interest to American contractors.

By Regions & Classes of Construction
(In order of Listing)

BIDS ASKED
LOW BIDDERS
CONTRACTS AWARDED

New England
Middle Atlantic
South
Middle West
(West of Mississippi)
Far West

PROPOSED WORK
Water Supply
Sewers, Waste Disposal
Bridges
Streets & Roads
Earthwork, Waterways
Public Buildings
Mass Housing
Commercial Buildings
Industrial Buildings
Unclassified

In These Stages

PROPOSED WORK: Before and including appointment of engineers or architects.
BIDS ASKED: BA (new announcements only). For full calendar, see also preceding issues.
SOON LETS CONTRACT: SLC
LOW BIDDERS: LB On jobs below $300,000 in value all low bidder news will be the final reports published on the projects involved except where award is not made to the low bidder. In this case, a supplementary contract award report will be published.
CONTRACTS AWARDED: CA Except awards to low bidders previously reported in low bidder stage.
CD dates shown are of Construction Daily issue in which last previous report was published.
OWNERS, ENGINEERS, ARCHITECTS, CONTRACTORS are invited to report their new jobs for listing in these reports when they meet or exceed the size minimums shown above. Address these news releases to J. A. Mahoney, REPORTS, ENGINEERING NEWS-RECORD, 330 W. 42 St., New York 36, N. Y.

Symbols and Abbreviations Include:

† Federal Government
▲ Project of $1,000,000 or over.
ENR Engineering News-Record
CD Construction Daily

For additional reports see Construction Daily.

SOUTH

HEAVY CONSTRUCTION—BA

STATE HIGHWAY LETTINGS
BRIDGES
June 3 North Carolina — June 4 Virginia
STREETS AND ROADS
June 3 North Carolina — June 6 Kentucky
June 10 West Virginia

▲† **Kentucky**—BA 6/5—U. S. Eng., P.O. Box 59, Louisville, Zone 1, dam and spillway, Buckhorn Reservoir, Middle Fork Kentucky River, Perry Co., ENG-15-029-58-56. $3,500,000. Extended date. CD 4/16.

BUILDINGS—BA

▲ **Ala., Birmingham**—HOUSING—BA 6/23—Housing Auth., 600 N. 24th St., 500 unit low rent housing, Avondale area. $6,500,000. Charles McCauley, Jackson Blvd., archt. CD 9/29/55.

HEAVY CONSTRUCTION—LB & CA

▲ **SOUTH CAROLINA**—State Hy. Dpt., Hotel Jefferson, Columbia, Bids opened 5/13,
S. C.—Sloan Constr. Co., Inc., Peoples National Bank Bldg., Greenville, S. C. LB **$404,207** (4 bidders) b. conc. 17.629 mi. US Rte. 29 and Int. Rte. 85. S. C. Dockets Nos. 4.435.1, 23.371.1 and 23.372.1 F.A. Projs. Nos. IN-F-85-2 (1) (F-2600 (1) IN-Ing-A 85-2 (1) (IN-Ing 2600 (4) IN-Ing-85-2 (3), (IN-Ing-2600 (3) IN 85 (1) 2600 (1), Anderson and Greenville Counties, LB **$643,915** (7 bidders) b. conc. surf. for widening 14.046 mi. Rte. 72 from Chester to Broad River, S. C. Docket No. 12.359 parts 1 & 2, F.A. Proj. No. DF-235 (11) Chester Co.; LB **$2,518,577** (8 bidders) b. conc. 8.614 mi. Int. Rte. 85 for constr. of 4 lane divided hy. from Road 62 to Road 41, S. C. Docket No. 42.486 F.A. Proj. No. I-85-2 (9) (I-301-1 (10) Spartanburg Co.;
S. C.—Sam A. Sloane Constr. Co., Fort Johnston Rd., Charleston, S. C. and **Johnny Smith Excavating Contractor**, Moore, S. C. LB **$458,948** (8 bidders) bit. surf. 1.07 mi. State Rte. 9 and constr. 400 ft. rein.-con. bridge at South Pacolet River; of 0.416 mi. Rd. 37 and constr. 400 ft. rein.-con. bridge at South Pacelot River and of 1.652 mi. Rd. 212 from Rd 211 SW S. C. Docket No. 42.484, F.A. Projs. Nos. S 374 (2) & S 1246 (1) Spartanburg Co. CD 5/1.

▲ **Baltimore Constr. Co.**, 711 S. Central Ave., Baltimore, Md., CA **$5,999,062**, Intracoastal Waterway Tunnel, open ramps, service road, 0.621 mi. and related work, Rte. LA 3040, SP 65-30-01, Houma, Terrebonne Parish, LOUISIANA. State Hy. Dpt., R. B. Richardson, dir., Hy. Bldg. No. 3, Baton Rouge, La. Bids Apr. 23. CD 4/25, under LB.

BUILDINGS—LB & CA

▲† **C. D. Spangler**, 1028 S. Blvd., Charlotte, N. C. CA **$4,948,643**, 304 units Capehart family HOUSING on site imprvs. and utilities, ENG-44-110-58-21 FORT LEE, VA. U. S. Eng., foot of Front St., Norfolk, Va. Bids about Apr. 23, awarded May 14. CD 4/25, under LB.

MIDDLE WEST

HEAVY CONSTRUCTION—BA

STATE HIGHWAY LETTINGS
BRIDGES
June 4 Michigan — June 10 Wisconsin
STREETS AND ROADS
June 4, 11 Michigan — June 10 Ohio, Wisconsin

▲† Illinois—BA 6/18—U. S. Eng., 475 Merchandise Mart, Chicago, Zone 54, Nike Anti-aircraft missile installations at Hecker, Marine and in Pere Marquette State Park. $4,500,000. Extended date. CD 5/13.

▲† O., Dayton—AIR BASE IMPRVS.—BA. 6/24—U.S. Eng., P. O. Box 59, Louisville 1, Ky., constr. SAC Dispersal Facilities, Wright Patterson Air Force Base, ENG-15-029-58-55. $15,000,000-$20,000,000. CD 3/12.

BUILDINGS—BA

▲ Mich., St. Joseph—SCHOOL—BA 6/10—City, Bd. Educ., Edward Starke, secy., high school. $3,000,000. Plans deposit $50. Eberle M. Smith Assoc., Inc., 153 E. Elizabeth, Detroit, archt. CD 6/28.

▲ Ill., East St. Louis—HOUSING—BA 6/19—East St. Louis Housing Auth., Stephen M. Harris, exec. dir. Spivey Bldg., three 8 story bldgs. and forty 2 story bldgs. in area bounded by Missouri Ave., 13th St., Broadway and 16th St., $7,890,750, Plans deposit $100, Joseph D. Standish, 710 Spivey Bldg., archt., Joseph Goldenberg, 624 Missouri Ave., engr., CD 3/17.

HEAVY CONSTRUCTION—LB & CA

▲ OHIO—State Hy. Dpt., Columbus, Zone 15, Bids opened 5/13,

O.—S. J. Groves & Sons Co., 500 Wesley Temple Bldg., Minneapolis, Minn., LB $5,948,320, est. $6,475,300 (6 bidders) Type T-71 and structures, 8.453 mi., SR 1-3.52, AC1-1105 (31), Ashland Co.;

O.—S. A. Ruebel & Co., 800 Ross Ave., Cincinnati 17, O., LB $2,380,010, est. $2,702,600 (7 bidders), Type T-71 and structures, 5.99 mi. USR 25-5.77, AC1-1101 (13), Butler Co.;

O.—V. N. Holderman & Sons, Inc., 890 Oakland Park Ave., Columbus, O. LB $2,896,773, est. $2,998,200 (7 bidders) Type T-71 and structures, 5.068 mi., SR 1-1.45, AC1-1105 (32) Richland Co.;

O.—George W. Lathrop & Sons, Inc., and The Peirce Constr. Co., P.O. Box 772, Toledo 1, O., LB $4,867,392, est. $4,972,200 (4 bidders) Type T-71 and structures 6.941 mi. U.S.R. 25-4.85, ACI-196 (10). Shelby Co. CD 4/22.

▲ MICHIGAN—State Hy. Dpt., John C. Mackie, hy. comr., Stevens T. Mason Bldg., Lansing, Mich.—Carl Goodwin & Sons, Allegan, Mich., CA $3,589,870, est. $3,890,000 (15 bidders) dual 24 ft. concrete pavement and 4 bridges 9.127 mi. US-131 from M-118 north to Wayland, BM 03112 C3-RN Bm B2 of 3-15-4 C1-RN Bm B3 of 3-15-4 C1-RN Bm B1 of 3-24-4 C1-RN BM B1 of 3-15-4, C1-RN, Allegan Co.; CA $1,352,625, est. $1,410,000 (11 bidders) grading, drainage structures, single and dual concrete pavement, ramps and service roads on Norton Glade Expressway, M 61151 C4-RN U 61151 C5-UN (U 253 19) 4.27 mi. Muskegon Co. Bids May 7, CD 4/24.

BUILDINGS—LB & CA

▲ City Constr. Co., 9404 S. Emerald St., Chicago, Ill., Own Forces $75,000,000, 5,000 HOMES, paving, sewers, Woodlawn Gardens EAST CHICAGO HEIGHTS, ILL.

WEST OF MISSISSIPPI

HEAVY CONSTRUCTION—BA

STATE HIGHWAY LETTINGS

BRIDGES

June 5, 6 Kansas — June 10 Texas — June 17 South Dakota

STREETS AND ROADS

June 5, 6, Kansas — June 6 Minnesota — June 10, 11 Texas — June 17 South Dakota

▲† N. M., Albuquerque—HOUSING—BA 6/5—Dpt. Air Force, c/o Directorate of Procurement, Kirtland Air Force Base, 490 unit family housing, Kirtland Air Force Base, ENG-29-601-58-120. $5,880,000. CD 9/17.

▲ Kansas—NIKE HERCULES MISSILE—BA On Or About 6/26—U.S. Eng., 1800 Federal Office Bldg., Kansas City 6, Mo., constr. four Nike-Hercules Missile areas consisting of 3 underground rein.-con. missile storage structures; refueling pits and barricades; missile assembly bldg, 2 electric generator bldgs.; personnel ready bldg; interconnecting corridor bldg; administration, recreation and storage bldg.; mess hall; two combined NCO and Officers Quarters; access roads, streets, parking areas and utilities in vicinity of Kansas City, ENG-23-028-58-77. Over $4,000,000. Plans deposit $52.

BUILDINGS—BA

▲ Ark., Pine Bluff—HOSPITAL—BA 6/5—Jefferson Co., Jose Hemslee, judge, Court House, 150,000 sq. ft. Hospital on 30 acre site, 40th and Mulberry, $4,500,000. Reed & Willis, National Bldg., Pine Bluff and Wittenberg, Delony & Davidson, Pyramid Life Bldg., Little Rock, archts., Rawland E. Blaylock & Assocs., Pyramid Life Bldg., Little Rock, Ark., engrs. CD 3/13.

▲ Kan., Kansas City—LIBRARY, etc.—BA 6/19—Bd. Educ., Kansas City, Public Library Bldg., 6th and Minn. Ave., Kansas City, Kan., general constr. library and school board administration bldg., incl. plumbing, electrical and heating. $7,000,000. Plans deposit $150. for general, $45 for trades. Edward Tanner & Assoc. 310 Ward Parkway, Kansas City, Kan., archts. CD 5/13.

HEAVY CONSTRUCTION—LB & CA

▲ Zenith Dredge Co., Fourteenth Ave. West and Railroad St., Duluth 2, Minn. LB $2,695,462 (5 bidders),

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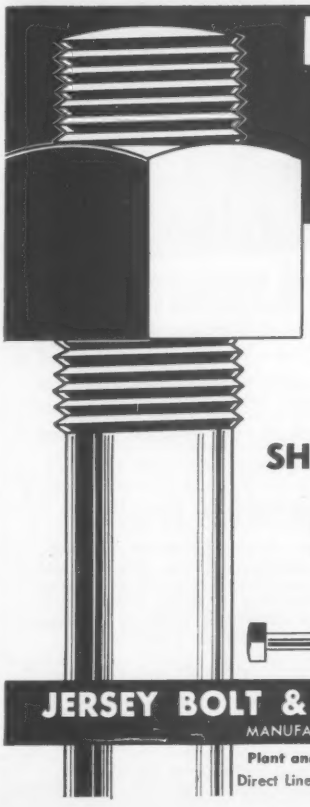

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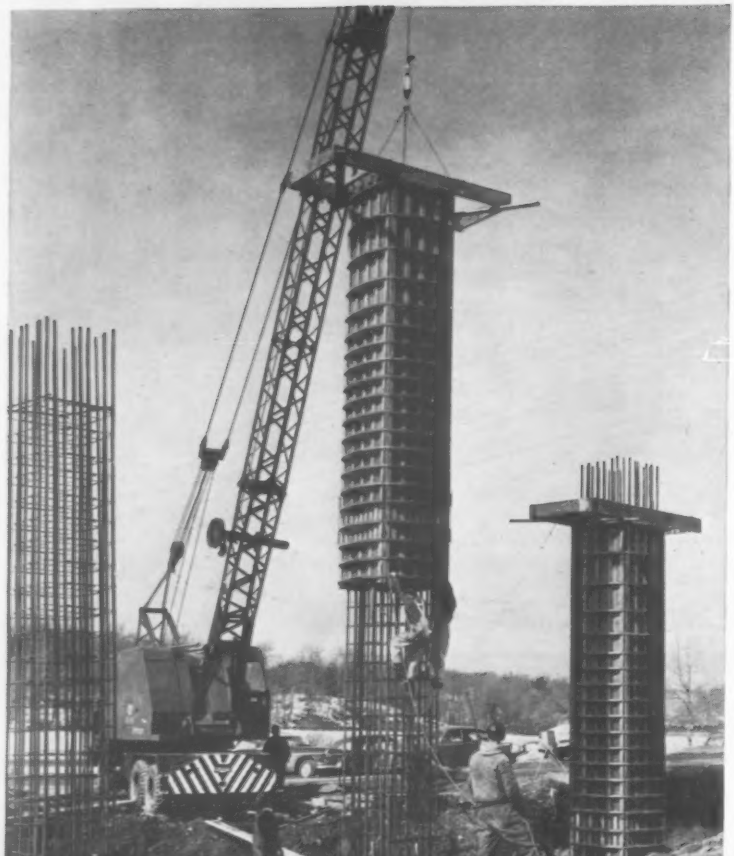

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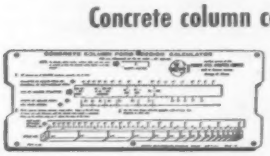

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constr. land development: 6,000 ft. wall bulkhead (sheet piling) and dredging 1,000,000 cu. yd., DULUTH, MINN. Duluth Port Auth., 909 Alworth Bldg., R. T. Smith, port dir., Duluth, Minn. Bids May 15. CD 5/2.

▲ **MISSOURI**—State Hy. Comn., Jefferson City, Mo.—**Porter DeWitt Constr. Co., Hannibal Constr. Co. and Valley Constr. Co.**, P. O. Box 279, Poplar Bluff, MO CA $3,212,064, graded earth, 2-24 ft. concrete pavements 6.884 mi., Franklin Co.;
Mo.—**Cameron Joyce & Co.**, Keokuk, Iowa, CA $615,236, graded earth, culverts 4.096 mi., Platte Co. Bids Apr. 25. CD 5/7, under LB.

▲† **Mary-Badgett** (Mary Constr. Co. and Badgett Strip Mining Co.), P.O. Box 423, Cape Girardeau, Mo., (joint venture) LB $6,107,602, est. $5,761,158 (4 bidders), completion of Pomme de Terre Dam and Reservoir, Missouri River, near Hermitage, involving 3,655,000 cu. yd. earth and 1,070,000 cu. yd. rock excav., 4,620,000 cu. yd. embankment, 11,600 cu. yd. concrete, 891,000 lb. reinforcing steel, 13,900 bbl. concrete, 560 lin. ft. culvert pipe, 50,000 tons aggreg. and 139,000 gal. bit. materials for service roads, CIVENG-23-028-58-104, MISSOURI. U.S. Eng., 911 Walnut St., Kansas City 6, Mo. Bids May 20. CD 4/8.

▲† **Winston Bros. Co., Johnson, Drake & Piper and Green Constr. Companies**, 1470 N. Western Bank Bldg., Minneapolis, Minn. LB $4,190,432, est. $3,800,000 (5 bidders) powerhouse substructure, Oahe Reservoir Proj., near Pierre, ENG-25-066-58-107, SOUTH DAKOTA. U. S. Eng., 1709 Jackson St., Omaha 2, Neb. Bids about May 15. CD 3/31.

▲† **Lipsett Inc.**, 99 Park Ave., New York, N. Y. CA $5,275,510, Schedules 1 and 2, domestic steel, Fort Peck Proj. Mont. and Transmission Div. No. D and Montana Missouri River Basin Proj., constr. foundations and furnishing, erecting steel towers for Fort Peck-Dawson County-Bismarck 230 kil. transmission line in McCone, Dawson and Wibaux Counties, Mont. and in Golden Valley, Billings, Stark, Morton, and Burleigh Counties, N. D., Spec. DC 5021, MONTANA and NORTH DAKOTA. Bureau Reclamation, Dpt. Interior, Bismarck, N. D. Bids Apr. 1, awarded May 14. CD 4/4, under LB.

▲† **Peter Kiewit Sons Co.**, 501 St. Johns Ave., Billings, Mont. LB $13,295,335 (5 bidders) runway aprons and utilities Glasgow Air Force Base, ENG-45-164-58-50, GLASGOW, MONT. U. S. Eng., City-County Airport, Walla Walla, Wash. Bids May 15. CD 4/8.

BUILDINGS—LB & CA

▲ **Kraus-Anderson, Inc.**, 501 South Eighth St., Minneapolis, Minn., CA $3,188,100, general contract, incl. all work, Glenwood Housing Proj. "Floyd Olson HOMES" Olson Hy. and Lyndale Ave. North, MINNEAPOLIS, MINN. Minneapolis Housing & Redevelopment Authority, R. Jorvig, ex. dir., Minneapolis, Minn. Bids May 8, CD 5/14, under LB.

▲ **Swan Constr. Co.**, 8130 Valcour, St. Louis, Mo., CA $2,755,805, est. $2,500,000, three BUILDINGS for Geneatric Infirmary Group at Missouri State Hospital No. 1 FULTON, MO. Missouri State Hospital No. 1, c/o Ralph McSweeney, dir. P. Bldgs., 100 State Capitol, Jefferson City, Mo. Bids May 6. CD 4/9.

▲ **The Rust Engineering Co.**, 930 Fort Duquesne Blvd., Pittsburgh 22, Pa. CA Est. $10,000,000 design and construct ROD MILL BLDG., KANSAS CITY, MO. Sheffield Steel Div.-Armco Steel Corp., Sheffield Station, Kansas City, Mo. CD 9/13.

▲ **George E. Tollefson**, 980 Simms, Denver, Colo., CA Approx. $2,500,000, 100-lane BOWLING ESTABLISHMENT, near GOLDEN, COLO. Jeffco Enterprises, Lakewood, Colo. Richard L. Crother, 257 Fillmore, Denver, Colo., engr.-archt.

FAR WEST

HEAVY CONSTRUCTION—BA

STATE HIGHWAY LETTINGS
BRIDGES
June 18 California
STREETS AND ROADS
June 18, 19 California

▲ **Calif., Long Beach**—DIKING, etc.—BA 6/12—Long Beach Harbor Dpt., 1333 Embarcadero, P. O. Box 570, diking, dredging and fill at Piers "F" and "G" Long Beach Outer Harbor, Spec. HD526 $6,500,000. CD 2/5.

▲ **Calif., Point Mugu**—RUNWAY EXTEN. etc.—BA 6/16—Eleventh Naval Dist., 1220 Pacific Hy., San Diego, exten. of Runway 12-30, widening, exten. runway and taxiway at San Nicholas Island Naval Air Missile Test Center. $4,000,000. CD 9/17.

▲† **Calif., San Clemente Island**—RUNWAY, etc.—BA 6/17—Eleventh Naval Dist., 1220 Pacific Hy., San Diego, 2nd increment, incl. runway taxiways, aircraft parking apron, missile launching area, at Naval Air Facility, Spec. 11687-57. $7,000,000. CD 9/18.

▲† **Oregon and Washington**—BA 7/1—U. S. Eng., City-County Airport, Walla Walla, Wash., first step Cofferdam for John Day Lock and Dam, CIVENG-45-165-58-53. CD 9/10.

BUILDINGS—BA

▲† **Calif., Hamilton Air Force Base**—HOUSING—BA 6/12—Procurement Officer, Hamilton Air Force Base,

constr. 550 units Capehart Housing. Hamilton Air Force Base, CD 1/8.

▲ **Calif., San Luis Obispo**—RESIDENCE HALLS, etc.—BA 6/18—State Div. Architecture, 1100 S. Grand Ave., Los Angeles, six 3 story, 233,000 sq. ft. floor area reinforced brick and masonry and concrete student residence halls and site development work, at California State Polytechnic College W.O. 4005GC-28 and 25. $3,900,000. Plans deposit $100. CD 7/24.

▲ **Calif., San Francisco**—OFFICE—BA 6/24—State Div. Architecture, 1120 N. St., Sacramento, 7 story, full bsmnt. and roof penthouse, 180,000 sq. ft. floor area, rein.-con. steel frame home office bldg. for State Compensation Insurance Fund, W.O. 4020SC. $3,175,000. Plans deposit $100. CD 12/14/56.

HEAVY CONSTRUCTION—LB & CA

▲ **Davis & Butler Constr. Co.**, 422 Dooly Bldg., Salt Lake City, Utah. CA **$6,834,327**, filtration plant mouth of Little Cottonwood Canyon Water treatment Plant, SALT LAKE CITY, UTAH. Metropolitan Water Dist., Fisher Harris, mgr., Tribune Bldg., Salt Lake City, Utah. Bids May 1. CD 5/6, under LB.

▲† **McCammon-Wunderlich Co., & Wunderlich Constr. Co., P. O. Box 359, Palo Alto, Calif. LB $7,057,620** est. $6,790,000 (5 bidders) dredging 7 mi. section Sacramento Deep Water Channel and related levee work, Spec. No. 2388 ENG-04-156-58-17, CALIFORNIA. U. S. Eng., 1209 8th St., Sacramento, Calif. Bids May 20. CD 3/17.

▲ **Utah Constr. Co.**, 100 Bush St., San Francisco, Calif. CA Approx. **$12,500,000**, constr. power tunnel at Mammoth Pool Dam, 60 mi. N.W. of Fresno, CALIFORNIA. Southern California Edison Co., 601 W. 5th St., Los Angeles, Calif. Bids May 9, awarded May 15. CD 5/16, under LB.

▲† **Cal-Apex Constr. Co.**, 12415 Ventura Blvd., Studio City, Calif. LB **$10,070,000**, constr. armed services housing at Edwards Air Force Base, ENG-04-611-58-200, MUROC, CALIF. Base Theater, Edwards Air Force Base, Muroc, Calif. Bids May 14. CD 4/23.

BUILDINGS—LB & CA

▲† **Burl Johnson & Assocs.**, P. O. Box 115, Fairchild Air Force Base, Spokane, Wash., CA **$3,602,200**, Capehart HOUSING, Geiger Air Force Base, SPOKANE, WASH., Procurement Officer, Geiger Air Force Base, Wash. CD 5/14, under LB.

▲ **Del E. Webb Constr. Co.**, 5101 San Fernando Rd. West, Los Angeles, Calif. CA **$7,302,145** constr. 525 family HOUSING units, incl. earthwork, utilities, sewage, etc. Cooke Air Force Base, LOMPOC, CALIF. Housing Contracting Officer, 392nd Air Base Group, Cooke Air Force Base, Lompoc, Calif. Bids Apr. 15, awarded May 14. CD 4/18, under LB.

▲ **J. C. Boespflug Constr. Co.**, 605 S. Lucas St., Los Angeles, Calif., CA **$6,320,000**, est. $5,000,000, 5 story, rein-con. Long Beach Memorial HOSPITAL, LONG BEACH, CALIF. City, City Hall, 205 W. Broadway, Long Beach, Calif. Bids May 7. CD 5/9, under LB.

▲ **General Electric Co.**, 1 River Rd., Schenectady, N. Y. LB **$16,611,800** (2 bidders) two cross compound single flow turbine generator units at Haynes STEAM PLANT, Seal Beach, LOS ANGELES, CALIF. Los Angeles Dpt. Water & Power, 311 S. Spring St., Los Angeles, Calif. Bids May 20. CD 4/23.

▲ **Morley Constr. Co.**, 7700 Sunset Blvd., Los Angeles, Calif. LB **$3,694,000** (7 bidders) U. S. Grant HIGH SCHOOL in SE San Fernando Valley, LOS ANGELES, CALIF. Bd. Educ., 1425 S. San Pedro, Los Angeles, Calif. Bids May 20. CD 4/29.

▲ **Twaits-Wittenberg Co.**, 507 S. Bixel St., Los Angeles, Calif. LB **$3,159,000** (5 bidders) constr. Road Dpt. ADMINISTRATIVE FACILITIES, 1540 Henry St., LOS ANGELES, CALIF. Bd. Suprvs. Los Angeles Co., 501 Hall of Records, Los Angeles, Calif. Bids May 21. CD 3/31.

▲ **Williams & Burrows**, 500 Harbor Blvd., Belmont, Calif. CA **$2,638,000** constr. RESIDENCE HALLS Nos. 2 and 3 at Santa Barbara College, Goleta Campus, SANTA BARBARA, CALIF. Bd. Regents, University of California, Admin. Bldg., Berkeley, Calif. Bids Mar. 4, awarded May 17. CD 3/7, under LB.

CANADA

HEAVY CONSTRUCTION—BA

STATE HIGHWAY LETTINGS
STREETS AND ROADS

June 4 Ontario — June 5 British Columbia

▲ **Que., Montreal**—BA 6/16—City, City Hall, filter gallery at City of Montreal, Waterworks, 3161 Blvd. Joseph, Verdun. $2,750,000. Plans deposit $200. CD 3/12.

BUILDINGS—BA

▲ **Ont., Toronto**—OFFICE—BA 6/17—Sun Life Assurance Co. of Canada, Victoria and Adelaide Sts., Toronto, Ont., and Sun Life Bldg., Montreal, Que., 12 story, penthouse, structural steel frame, aluminum, office bldg., Richmond St. W., $5,000,000. John B. Parkin Assocs., 1500 Don Mills Rd., Postal Station "J", Don Mills, Toronto, archts. CD 5/23/56.

HEAVY CONSTRUCTION—LB & CA

▲ **Mannix Co. Ltd.**, 604 Northern Hardware Bldg., Edmonton, Alta., CA Approx. **$2,200,000**, 90 mi. 10 in.

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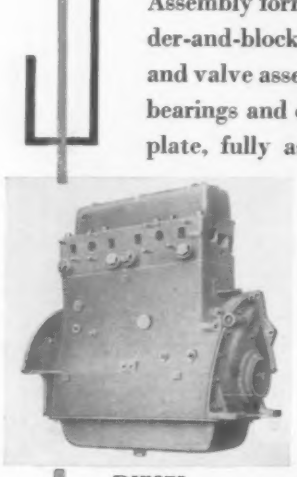

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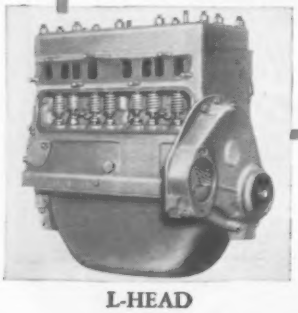

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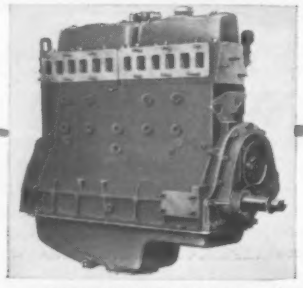

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lateral pipeline extending from North Bay to Sudbury to service communities in Northern Ontario with natural gas, North Bay, CA Approx. $500,000, 40 mi. 2- to 8-in. distribution line in Sudbury-Copper Cliff Area, to service this community with natural gas, Sudbury, ONTARIO. Northern Ontario Gas Co. Ltd., 170 University Ave., Toronto, Ont. Grand total $3,700,000, awarded May 12;

Campion Pipeline Services Ltd., Head Office, Box 4065 South Edmonton, Alta., CA Approx. $1,000,000, 130 mi. pipeline to serve Hearst, Kapuskasing, Smooth Rock Falls, Cochrane, Iroquois Falls, Ansonville, Matheson, Ramore and incl. 32 mi. lateral to serve Timmins with distribution to service Schumache south Porcupine and Porcupine with natural gas, Hearst, (Ontario).

PROPOSED PROJECTS

WATER SUPPLY

▲ **Wis., Milwaukee**—City, City Hall, South side intake and crib to Texas Ave., $1,500,000; raw water pumping station, Texas Ave., $700,000; filter plant and pumping station, Texas Ave., $1,070,000; 10 m.g. reservoir, Texas Ave., $685,000; 15 m.g. reservoir, Northwest side, $750,000; 84 in. raw water main from Texas Ave. site to south side filter plant, $1,100,000; water main, $2,400,000 constr. 1958. Black & Veatch, 4706 Broadway, Kansas City, Mo., consult. engrs., E. A. Schmidt, city engr. CD 10/24/56.

SEWERS, WASTE DISPOSAL

▲ **Calif., Palm Springs**—City, City Hall, voted $1,550,000 bonds Apr. 29, sanitary sewers. CD 3/28.

▲ **Tex., Corpus Christi**—City, City Hall, sanitary sewerage sys. projs. $4,698,410; storm sewers, drainage $1,172,000; part of 5 year program.

BRIDGES

▲ **Pa., Phila.**—Dpt. Procurement, City Hall, Annex No. 153, Whitaker Ave. Bridge over Tacony Creek, $400,000.

No. 154, Verree Road Bridge over Pennypack Creek $300,000.

No. 155 Cherokee Ave. Bridge over Valley Green Road $300,000 all foregoing constr. 1959.

No. 156 Grays Ferry Ave. Bridge over Schuylkill River $4,750,000 constr. 1962-63.

No. 1517, Spring Garden St. Bridge over Schuylkill River incl., eastern approaches $2,000,000 Constr. 1962.

No. 158 Bridge over P. N. & N. Y. RR $220,000 constr. 1962.

No. 159A Wissahickon Ave. Bridge over Lincoln Dr. $1,440,000, constr. beyond 1963.

Bridge Champlost Ave. underpass east of 9th St. $530,000. David M. Smallwood, streets constr.

EARTHWORK, WATERWAYS

▲ **N. J., Port Newark**—Port of New York Auth., 111 Eighth Ave., New York 11, N. Y., 3-berth terminal on north side of Port Newark Channel comprising a 56 ft. wide reconstr. wharf extending 1,900 ft. along the Port Newark Channel, providing 3 deep-sea ship berths. The berths will be supported by 273,000 sq. ft. transit shed space, 100 ft. wide roadway and 340,000 sq. ft. paved, lighted upland area. $6,100,000. CD 12/2/55.

AIRPORTS

▲ **Okla., Tulsa**—AIRPORT IMPRVS.—City, City Hall, voted bonds May 6, airport imprvs., $4,200,000. W. R. Wooten, City Hall, engr. CD 4/28.

PUBLIC BUILDINGS

▲ **Ala., Mobile**—HOUSING—Mobile Housing Auth. Bd., 1555 Eagle Dr., Mobile, plans by Harry Inge Johnstone, Annex 1st Natl. Bk. Bldg., 2,180 low-rent housing units. $23,000,000.

▲ **Calif., La Jolla**—LABORATORY—University of California, at Scripps, La Jolla, plans by Risley & Gould, 2502 W. 3 St., Los Angeles, 3 story Type I concrete laboratory bldg. at Scripps College. $1,600,000. CD 7/23.

▲ **Colo., Pueblo**—SCHOOLS, etc.—School Dist. No. 60, 102 West Orman Ave., voted $7,750,000. bonds May 5, elementary schools, two new Junior High Schools. CD 3/11.

▲ **Conn., Darien**—SCHOOL—Town, Town Hall, plans by Ketchum, Gina & Sharp, 227 E. 44th St., New York, N. Y., high school, $3,000,000. CD 4/30.

▲ **Fla., Palatka**—SCHOOL—Putnam Co. Bd. P. Instruction, Palatka, plans by A. E. Cellar & R. Broadfoot, Jr., 502 Riverside Ave., Jacksonville, Zone 2, St. Johns River Junior College, $1,500,000.

▲ **Ind., Wabash** — SCHOOL — North Manchester-Chester Twp. School Dists., Wabash, consolidated school, North Manchester and Chester Twp. area, $3,000,000.

▲ **Kan., Kansas City**—LIBRARY, etc.—Bd. Educ., Kansas City Public Library Bldg., 6th and Minn. Ave., voted bonds May 6, library and school offices, and school addn. $6,850,000. CD 4/18.

▲ **La., Grambling**—DORMITORIES—Grambling College, Dr. R. W. E. Jones, pres., plans by J. I. Schierer, 976 Jordan, Shreveport. Unit A-2 dormitories for 200 men students; Unit B-2 dormitories for 200 women students; plans by A. T. Turpin, 2400 Louisville Ave., Monroe, La., Unit C, student union bldg. and cafeteria; plans by Barron Hunburg & Brocalo, 1015 Wisteria, Alexandria, La., Unit D, 1,800 capacity dining hall. (Proj. La. 16-CH-17 DS), all foregoing at $3,000,000. CD 12/5.

▲ **Mo., Clayton**—(St. Louis 5 P.O.)—CIRCUIT COURTS, etc.—St. Louis County, c/o Luman F. Matthews, co. superv., Court House, Zone 5, circuit courts, magistrates courts and offices of circuit clerk and sheriff in area bounded by Central, Meramec, Bonhomme and Carondelet Aves. Over $2,000,000. Leo A. Daly Co., 3207 Olive St., St. Louis, Zone 3, archt. for preliminary studies needs and costs. CD 6/22/55.

▲ **Mo., Webster Groves (St. Louis 19 P. O.)**—SCHOOL—School Dist. of Webster Groves, Bd. Educ., Dr. Herbert W. Schooling, supt. Schools, 16 Selma Ave., Webster Groves, Zone 19, voted $3,055,000 bonds May 8, Junior High School near Brownbert Lane and Rock Hill Rd., $1,625,000; Junior High School, Lockwood and Plymouth Aves. $1,530,000. Hellmuth, Obata & Kassabaum, Inc., 315 N. 10th St., St. Louis, Zone 1, archts. CD 4/17.

▲ **N. Y., New York**—SCHOOL—Bureau Constr. Bd. Educ., 42-15 Crescent St., Long Island City, plans by Chapman Evans & Delehanty, 50 Broadway, Zone 4, Proj. E-426, P. S. 128, vicinity Audubon Ave. and West 169th St. $3,800,000. CD 5/28.

▲ **N. Y., New York**—SCHOOL—Bureau Constr., Bd. Educ., 42-15 Crescent St., Long Island City, plans by Unger & Unger, 130 Broadway, Brooklyn, Zone 11, Proj. E-454, P. S. 145, vicinity Amsterdam Ave. and West 105th St. $2,900,000. CD 3/27.

▲ **O., Adams**—SCHOOLS—Bd. Educ., Carl J. Ramus, Supt., 1800 Krieger Dr., Toledo, defeated bonds May 6, Junior High School, new grade school, addns. to present bldgs. $2,280,000 incl. land. CD 1/6.

▲ **O., Lorain**—SCHOOL—Bd. Educ., Lorain, defeated 7-mill levy May 6, high school. $4,816,000, Fulton, DelaMotte & Assocs., 6014 Euclid Ave., Cleveland, Zone 3, archts. CD 3/26.

▲ **O., Medina**—SCHOOLS—Cloverleaf School Dist., Medina, defeated bonds May 6, schools. $1,500,000. CD 2/14.

▲ **O., Parma**—SCHOOLS, etc.—Bd. Educ., 5401 W. 54th St., Cleveland, Zone 28, voted bonds May 6, 4 elementary schools and Central Warehouse, $2,850,000. Fulton De la Motte & Assocs., 6014 Euclid Ave., Cleveland, Zone 3, archts. CD 2/14.

▲ **O., Tiffin**—SCHOOL—Bd. Educ., Tiffin, voted bonds, May 6, high school, $1,967,000. Bellman, Gillett & Richards, 1600 Madison St., Toledo, archts. CD 1/13.

▲ **O., Van Wert**—SCHOOLS—Van Wert Bd. Educ., defeated bonds May 6, schools, $1,700,000. CD 11/21.

▲ **Pa., Emmaus**—SCHOOL—East Penn Union School Dist., high school. $3,250,000.

▲ **Pa., Phila.**—HOSPITAL—Dpt. Procurement, City Hall Annex, plans by Geo. I. Lovatt, city archt.
No. 55, Phila. General Hospital—Blockley Div., Examiner Bldg. $1,293,000, Constr. 1960.
No. 56, Phila. General Hospital—Blockley Div., Nurses Home addns., alterations, renovations. $2,140,000. Constr. 1959 ($275,000) and 1963 ($1,865,000).

▲ **Tex., Austin**—STUDENT UNION—University of Texas, c/o Main Admin. Bldg., plans by Page, Southerland & Page, archts., Box 855, Austin, and Golemon & Rolfe, archts.-consult. engrs., 5100 Travis, Houston, student union. $2,000,000. CD 3/19/57.

▲ **Tex., Prairie View**—STUDENT UNION, etc.—Prairie View College, E. B. Evans, pres., student union, $1,000,000; dormitory, $500,000; science, $1,500,000. CD 12/13.

▲ **Tex., San Antonio**—SCHOOL—Harlandale Ind. School Dist., 300 W. Huff Ave., voted bonds May 10, high school, $1,650,000; elementary school, $350,000. CD 4/28.

▲ **Wis., Madison**—COMMERCE SCHOOL—University of Wisconsin, 5 story Commerce School addn. $1,700,000, R. C. Kirchhoff, state archt.

▲ **Wis., Milwaukee**—SCHOOL—Bd. School Directors, 1111 N. 10 St., Zone 3, plans by Fritz von Grossmann, 5455 W. Burleigh St., Robert Fulton Junior High School N. 1st and E. Center Sts. $2,500,000, CD 1/21/57.

▲ **Ont., Welland**—HOSPITAL—Hospital Bd., J. F. Swayze, chn., 57 Main St. E., plans by Agnew, Ludlow & Scott, 25 Merton St., Toronto, T-shaped hospital, 6 story patients' block, 3 story administration bldg., delivery and operating rooms, brick, masonry, rein.-con. frame, $3,750,000. Halsall & Dowdell, 752 A Yonge St., Toronto, consult. engrs. Agnew, Craig & Peckham, 200 St. Clair Ave. W., Toronto, hospital consults. CD 2/14/57.

COMMERCIAL BUILDINGS

▲ **Calif., Anaheim**—BUSINESS CONVENTION CENTER—James L. Fallon, 7805 W. Sunset Blvd. Los Angeles, plans by Daniel, Mann, Johnson & Mendenhall, archts.-consult. engrs. 3325 Wilshire Blvd., Los Angeles, business convention center with hotel, auditorium and exhibition hall near Disneyland. $15,000,000.

▲ **N. Y., New York**—APARTMENT—O. Roy Chalk Realty & Constr. Co., 160 Central Park So., Zone 19, plans by Paul Resnick, 654 Madison Ave., Zone 21, 15 story apartment, 150-64 E. 77th St. and 1091-7 Lexington Ave. $2,000,000.

▲ **N. Y., New York**—APARTMENT—Dworman Assocs., 400 Park Ave., Zone 17, plans by Paul Resnick, 654 Madison Ave., Zone 21, 12 story apartment, 151-89 E. 76 St. $1,900,000.

▲ **N. Y., New York**—APARTMENT—Shapiro & Weingrow, 2245 E. 17th St., Brooklyn, Zone 29, plans by Paul Resnick, 654 Madison Ave., Zone 21, 16 story apartment, 955-67 Madison Ave. and 29-37 E. 75th St. $2,000,000.

▲ **O., Austintown**—SHOPPING CENTER—Edward J. DeBartolo, 2620 Market St., Youngstown, 40-unit brick, steel shopping center, Rte. 18. $3,000,000.

▲ **O., Cincinnati**—SHOPPING CENTER—James R. Williams Inv. Co., Union Trust Bldg., plans by Cordes, Pressler, Houck & Assocs., archts.-engrs., 4939 Paddock Rd., 60,000 sq. ft. 1-floor, shopping center addn. $1,500,000 (to H. S. Pogue Co., 4th and Race St., lessee). Bids in 30 days.

▲ **O., Springfield**—COLLEGE EXPANSION—Wittenberg College, N. Wittenberg Ave., college expansion, incl. new compound for Hamma Divinity School, Music and Drama Bldg., new women's Dormitory, and Faculty Residence Compound. $4,000,000. CD 3/25/54.

▲ **Tex., Dallas**—SHOPPING CENTER—Angus G. Wynne Jr., 401 Wynnewood Village, shopping center expansion. $1,500,000.

▲ **Tex., Fort Worth**—SHOPPING CENTER—Frank C. Bliss, 417 W. 7th St., 1 story, brick, tile, concrete, steel, 170,250 sq. ft. floor space, 1st unit of Bliss Shopping Center, Terrant Rd. and Edgewood Ter. $1,750,000.

▲ **Tex., San Antonio**—APARTMENT—H. B. Zachry Properties, Constr. Div., Box 10188, "Garden Type" apartment, off Klaus Rd. $2,500,000.

▲ **Tex., Victoria**—POSTOFFICE, etc.—General Services Admin., F St. between 18th and 19th Sts. N.W., Wash., D. C., plans by Jordan C. Ault & Robert Rick, Victoria, and Page, Southerland & Page, 602 W. Ave., Austin, constr. U. S. Postoffice and Courthouse (lease-purchase proj.). $1,563,000. CD 11/27.

▲ **Que., Baie D'Urfee**—HOUSING—Baie D'Urfee Land Holding Ltd., 6297 Deacon Rd., Montreal, housing program. $2,000,000.

INDUSTRIAL BUILDINGS

▲ **N. Y., Tonawanda**—PLANT—American Brake Shoe Co., Mountain Ave., Rochester, will not construct plant to construct cast steel railroad car wheels. $6,000,000. Project abandoned. CD 10/16.

▲ **Tex., Kermit**—PLANT—West Texas Gathering Co., Colorado City, gas treating plant units. $1,500,000.

▲ **Que., Baie des Anglais**—GRAIN ELEVATOR—Cargill Grain Co. Ltd., 209 Grain Exchange Bldg., Winnipeg, Man., grain elevator, $1,500,000. C. D. Howe Co. Ltd., 710 Public Utilities Bldg., Port Arthur, Ont., consult. engrs.

UNCLASSIFIED

▲ **Louisiana**—PIPE LINES—Trunkline Gas Co., 5650 Kirby Dr., Houston 1, Tex., constr. pipe line crossing Red River, Rapides Parish. $1,750,000.

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. . . look at his backhoe!

It's the all-new *SHAWNEE 88*. He can knock off for a smoke because he's long on time. Earth has never been trenched faster!

Buy-wise and bid-wise, the *SHAWNEE 88* gives you a profit edge. It's the one backhoe built for a fast operator. Plenty of digging power. No sweat, either. The *SHAWNEE 88* is smooth and fast — the fastest backhoe of them all. Ever see one styled to beat it?

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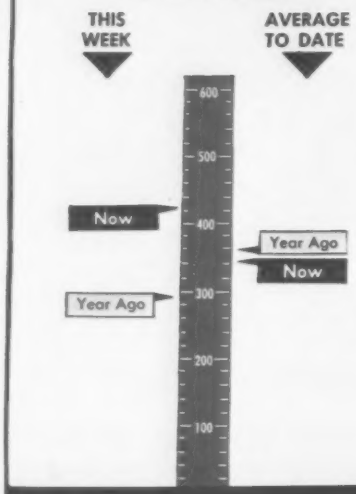
Construction Scoreboard

ACTIVITY THIS WEEK

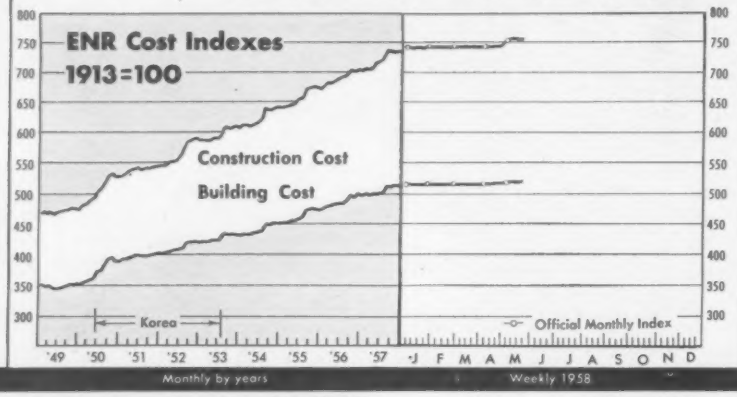
Contract Awards
Millions of Dollars



COST INDEXES AS OF NOW

ENR INDEXES (1913=100), 20-cities' average	Week of May 22 1958	% Change from Apr. 24 1958	% Change from May 23 1957
Construction Cost	755.40	+1.1	+5.1
Building Cost	519.53	+0.3	+3.2

To convert above indexes to 1926 = 100: Divide Construction Cost by 2.080; Building Cost by 1.850.
1949 = 100: Divide Construction Cost by 4.770; Building Cost by 3.518.



AMOUNT OF CONTRACTS LET

By Ownership	This Week	Cum. 22 wks 1958	Chge '57-'58 %
	millions		
All Heavy Constr.	$424.0	$7,728.3	−2
Private	155.6	3,538.6	−4
Public	268.4	4,189.7	−0.3
State & Municipal	178.1	3,174.1	+7
Federal	90.3	1,015.6	−18
By Type of Work			
Public			
Waterworks	13.8	129.4	−28
Sewerage	18.0	241.2	+27
Bridges*	12.8	216.6	−24
Highways	68.6	1,228.5	0
Earthwork, Waterways	18.3	406.6	−25
Buildings, Excl. Housing	54.5	1,079.7	+16
Housing	36.8	464.7	+53
Unclassified	45.7	431.3	−21
Private			
Mass Housing	79.2	1,610.8	+25
Commercial	49.0	892.6	+20
Industrial	17.5	825.3	−42
Unclassified	9.8	201.6	−7

* Includes private bridges.

NOTE: Minimum size projects included are: Waterworks and waterways, $44,000; other public works, $73,000; industrial buildings, $93,000; other buildings, $344,000.

NEW CAPITAL FOR CONSTRUCTION

	Week of May 22	Cum. 21 wks 1958	Chge '57-'58 %
	millions		
Corporate Securities	$103.7	$2,374.1	−6
State and Municipal:			
All Except Housing	235.7	3,049.5	+29
Housing	...	20.3	−51
Federal Loans	3.9	77.8	−15
Federal Aid	...	....	....
Total Nonfederal	$343.4	$5,521.7	+5
Federal Appropriations:			
Projects in U.S.	...	$603.2	...
Outside U. S.	...	....	...
Total New Capital	$343.4	$6,124.8	+16

BACKLOG OF PROPOSED HEAVY CONSTRUCTION

	Apr. 1958 (millions)	Percent Change from last Month	Year
Total U. S. (ENR reported)	$112,676	−0.3	+6.2
By Ownership—			
Private	47,569	−0.4	+5.8
State & Municipal	51,241	−0.04	+7.4
Federal	13,866	−1.0	+3.3
By Type of Work—			
Waterworks	2,415	−0.2	+6.6
Sewerage	3,411	+0.3	+3.7
Bridges	3,447	+0.04	+13.1
Highways	13,484	+0.6	+4.6
Earthwork, Waterways	12,267	−0.3	+9.3
Public Buildings	20,141	−0.6	+4.2
Industrial Buildings	16,679	−0.8	+1.4
Commercial Buildings	21,021	−0.1	+9.8
Unclassified, Private	9,869*	−0.2	+5.5
Unclassified, Public	9,941	−1.0	+9.1

* Includes Private Bridges, $84 million

FLOW OF NEW PROJECTS INTO THE BACKLOG

	1958 Apr. (millions)	4-months	Percent Change from '57 Apr.	Year Cum.
Total U. S. (ENR reported)	$1,073	$5,755	−21.7	−20.0
By Ownership—				
Private	450	2,512	−36.8	−33.7
State & Municipal	584	2,756	+13.0	−8.5
Federal	39	487	−58.7	+22.3
By Type of Work—				
Waterworks	21	58	+7.1	−54.4
Sewerage	53	227	+89.9	+6.0
Bridges	26	217	+189.4	+22.1
Highways	249	872	+62.6	−18.8
Earthwork, Waterways	8	118	+5.7	+78.6
Public Buildings	234	1,216	−37.7	−18.2
Industrial Buildings	77	516	−74.2	−64.6
Commercial: Mass Housing	145	727*	+5.6	−26.8
Other Building	196	1,149*	−17.1	+9.0
Unclassified, Private	32	120**	−19.4	−59.3
Unclassified, Public	31	535	+69.4	+102.6

* Previous month revised ** Includes Private Bridges, $500,000

FLOW OF PROJECTS OUT OF BACKLOG INTO CONTRACTS

Total U. S. (ENR reported)	747	2,846	+6.5	−8.8
By Ownership—				
Private	240	960	−6.0	−20.4
State and Municipal	375	1,494	+14.6	+7.0
Federal	132	392	+11.5	−24.2

THE LONGER LOOK:

Fast depreciation, used during wartime to spur construction of defense production facilities, is gaining support now as an incentive to step up buying of recession-hit capital goods.

As Congress gets ready to take up tax legislation, these plans are being considered:

(1) Five-year amortization of all productive equipment installed between January 1, 1958 and June 30, 1959.

(2) Temporary shortening of useful life for tax purposes by one-half on the first 15 years and two-thirds on excess over 15 years.

(3) Permanent reform of depreciation rules, putting all new plant and equipment under a simplified "bracket system" with faster write-off rates.

But poor profit outlook raises question . . .

How Much Lift in Fast Tax Write-Offs?

Reform of depreciation provisions is rapidly taking shape as one of the most likely concessions to business in this year's tax legislation. The decision may come in the next four or five weeks, because Congress must act on some $3 billion in excise and corporate income taxes due to expire June 30.

Leaders in both Congress and the Administration already have indicated sympathy for proposals to speed up depreciation rates. There is some support for temporary incentives to stimulate orders for industrial construction and machinery, both sore spots in the business recession. But permanent reforms, regarded by some experts on depreciation as long overdue, also are urged.

Advocates of fast depreciation as a spur to capital investment are taking their cue from successful use of this device in wartime, when the country needed defense production facilities. The program of five-year amortization adopted during the Korean war led to the granting of special certificates for proposed facilities totaling over $38 billion.

Three main plans are being weighed in the current study of faster tax write-offs:

- Five-year amortization for all durable productive equipment purchased between January 1, 1958 and June 30, 1959. This retroactive and temporary amortization proposal is being advanced as a short-term anti-recession measure by the National Machine Tool Builders' Association.
- Temporary scaling down of the term of useful life over which capital assets must be depreciated. Sen. Homer Capehart has proposed that for any capital investment made or contracted for in the 18 months from January 1, 1958 to June 30, 1959, the first 15 years of estimated useful life be cut by half and the period over 15 years by two-thirds. Thus, a factory building that normally must be depreciated over 40 years could be written off in 16 years.
- As a permanent reform, there is widening support for a "bracket" system patterned after the Canadian tax law. This would allow the taxpayer to select any useful life, or rate of depreciation, within a specified range. There would be 10 to 15 brackets covering all types of capital goods. In general, these would allow faster depreciation than present U. S. tax regulations.

In addition, there is some sentiment for a change in depreciation provisions to allow taxpayers to take account of inflation. The most prominent suggestion is that depreciation be allowed at replacement cost, rather than original cost. The threat of heavy losses of tax revenues from this proposal, however, pretty well assures its rejection.

A major revision of the depreciation provisions was made by Congress in 1954, when it overhauled the entire tax code. The biggest change was the authorization of two new methods of depreciation—the double declining balance and the sum-of-the-years' digits—which permitted the charging off of the major part of depreciation in the early years of useful life.

The main complaint now is that the periods of useful life followed by the Internal Revenue Service are too long.

(*Continued on page 84*)

They are considered unrealistic in light of the fast pace of technical progress. They drag out the recovery of investment. And they delay replacement of obsolete plants and equipment.

Advocates of faster tax write-offs argue that some speed-up of the schedule of useful life—last revised in 1942—is long overdue. Also, they contend that concessions now would result in a large volume of new business for builders and equipment producers.

The big question mark is whether tax savings on depreciation (actually tax postponements) would tempt companies that face a dim profit outlook. Larger depreciation charges reduce the tax bill, but they do so by cutting reported income. To many companies that are barely covering their dividends, and especially those cutting or suspending distributions to stockholders, a heavier charge for depreciation does not look attractive.

Still, higher depreciation allowances do mean a larger tax-free cash flow for a corporation. Companies that have no worries about meeting dividends and would like the cash to finance continued expansion may strike at the bait. The trouble is that companies without profit worries and with need for more capacity are not so easy to find as they were two or three years ago.

Building Ahead

Portland, Ore., voters approve urban renewal, exposition area, schools

Voters of Portland, Ore., have approved a mixture of construction projects ranging from urban renewal to an exposition-recreation center. Their votes fueled for rapid progress:

- Redevelopment of an 83.5 acre blighted area south of the city's business district on the west side of the Willamette River.
- A $3 million modernization of the city fire department, including construction of 14 new fire houses.
- Building of an $8 million exposition-recreation center across the Willamette from downtown Portland.
- School construction to be financed from a three-year levy expected to raise $1.65 million annually.

The vote on urban renewal approved a special levy for raising the city's share of the project—$400,000 a year over the next five years. The vote came two days after the Federal Urban Renewal Agency announced its willingness to lend $9.45 million for land acquisition and clearance. The agency also approved a $2.1 million grant as the federal government's two-thirds contribution to the net cost. Webb & Knapp, Inc., of New York City, has told the city it is ready to negotiate for an estimated $30 million construction program in the redevelopment area.

The recreation-exposition center got its boost forward when voters turned down a proposal to change the site, which would have delayed completion a year. The 22 acre site has been cleared and architects Skidmore, Owings & Merrill expect to invite bids on the arena building and adjoining exposition hall by mid-June.

The voter action came on top of a State Highway Commission decision to start work on a $235 million urban freeway network for the city. The commission will commence surveys and right-of-way acquisition for the first stage of the program—the $44.6 million East Bank Freeway along the Willamette River (ENR May 22, p. 24).

Bridge Troubles

Debt limit boost urged for Delaware bridge

Another round of interstate feuding may be touched off by a decision to ask the Delaware General Assembly to boost the debt limit on the Delaware Memorial Bridge from $46.5 million to $58.5 million. The move was made by the directors of the Delaware Interstate Highway Division, which operates the bridge. The additional bonds would be sold to finance construction of improvements, beginning with a freeway now under way from the bridge's Farnhurst interchange to the Maryland line south of Newark. Construction at present is being financed by the state treasury.

The decision follows approval of a reduction in bridge tolls (ENR May 1, p. 78) that set off a storm among New Jersey officials. Tolls are being cut on June 1 so as to extend retirement of bonds and postpone the day when Delaware must pay operation and maintenance costs—estimated at $1 million yearly—from its treasury.

Meanwhile, the fight to keep the bridge from attaining a toll-free status, as the law currently requires when bonds are retired, has been carried to the U. S. Senate. Delaware Senators J. Allen Frear and John J. Williams have proposed a bill that would give the state authority to collect tolls indefinitely; first to finance improvements such as approaches, and ultimately for perpetual maintenance and operation of the bridge.

New Jersey also has had its eye on the bridge's revenues. It has sweetened its overtures by proposing to share operation of the facility with Delaware under the overall authority of a bi-state river crossing agency. Besides this function, the agency would undertake other bridge and ferry projects.

So far, the states have not been able to agree on a division of the income under a two-state plan. Also, Delaware wants to avoid giving New Jersey veto power over use of revenues for other projects. In the meantime, New Jersey has sought to prevent Delaware from altering the existing law about the tolls. When a bill was introduced in the U. S. House two years ago, opposition from New Jersey legislators killed it in committee. The strategy, some believe, is to frustrate Delaware's plans until the state is willing to compromise on the bi-state scheme.

Builders Join to Provide New School Free to Town

Fourteen homebuilders operating in Raritan Township, Monmouth County, N. J., are cooperating in construction of a $630,000 elementary school that will be turned over the the community at no cost to the taxpayers. The town will pay only for furnishing, staffing and operating the facility.

The venture is the outcome of meetings with the builders and town officials in 1956, when the mayor explained the problems and costs that would result from the large-scale housing construction programs of the builders. Together, the builders anticipate that they will build 2,700 homes in the township. The tax burden that loomed for education alone was a factor the town and its residents could not overlook.

Recognizing this problem, the builders appointed three trustees to find and buy land on which a 26 room school could be built. A 15 acre site was bought for $65,000 and construction started recently on the first two of five classroom structures. These two buildings of the campus-type facility will cost $165,000. The remaining structures will cost an estimated $400,000.

New York City Industrial Park Proposal Moves Ahead

A proposed $30 million Industrial Park for Brooklyn, New York City's first, passed its initial test recently when the City Planning Commission approved zoning and street changes requested by the sponsor, Milton M. Steinberg Associates (ENR Apr. 3, p 17).

The commission reported that the industrial park could provide about 2,000 jobs.

Wage Talks Show Mixed Results

Efforts of some contractor groups to keep boosts down pay off as bigger increases occur elsewhere

Several segments of the construction industry already have rejected with varying degees of success two ideas that President Eisenhower last week nominated "for oblivion." And those are the ideas that "the consumer is not price conscious any more" and that "large annual wage increases can be regarded as a matter of course."

Areas in which the rejection has occurred in current collective bargaining include:

• Cleveland, where contractors have been engulfed in a $250 million strike and lockout since May 1 in an effort to hold down building costs.

• Detroit, where for the last two weeks the industry has accepted a carpenters' strike rather than retract its demand for a wage freeze.

• Several New Jersey counties, in which wage-freeze efforts of the Building Contractors Association of New Jersey have paid off in three new settlements that hold present and deferred wage increases below levels that were reached last year.

In contrast to these, however, a number of new wage settlements appear to have been unaffected by recession fears or the specter of unemployment. Even long-term contracts with deferred wage boosts of 10 cents or more an hour are not uncommon.

Here's a rundown of some of the new agreements.

•**New Jersey**—Some 2,000 laborers (who have been getting $3.10 plus 10 cents health and welfare) in Bergen County have agreed to a contract that will spread a 25 cent wage increase over a three-year period—5 cents to a pension fund now and another pension fund increase of 5 cents next May, a 5 cent wage boost next May and a 10 cent wage increase in May 1960. They have also agreed not to ask for a further pension increase for five years.

Plumbers in Bergen and Passaic Counties have accepted a two-year proposal for a 25 cent wage increase now with no increase the second year. Contract can be reopened on fringe benefits only in 1959. Old rate was $4.00 plus 12½ cents welfare.

Laborers in the Morristown area of Morris County have accepted a one-year contract for a 10 cent wage increase and have given up showup time pay called for in the old contract. New rate will ge $3.10 plus 10 cents welfare.

• **Delaware**—Over 1,300 carpenters in Wilmington have ended a 13-day strike by accepting a four-year contract that provides for a gradual wage increase of 55 cents over the present hourly rate of $3.35. New pact with Allied Construction Industries of Delaware grants a 20 cent increase now, 15 cents next year and an additional 10 cents each succeeding year.

• **New York**—Striking members of the sheet metal and asbestos workers unions in Watertown have settled on a one-year contract adding 22½ cents to present scale of $3.35. Carpenters in three upstate counties have accepted a three-year contract granting a 50 cent increase, including 10 cents for welfare.

• **Ohio**—Agreement has been peacefully reached on two-year contracts covering 10,000 Toledo construction workers. The pattern settlements call for a 10 cent wage boost each year. First increase raises the new average hourly wage in the area to $3.72. Lathers in Columbus have settled for 18 cents in a one-year contract, Dayton painters for 23 cents over two years.

• **Oregon**—A new three-year contract gives linoleum workers in Portland a 37½ cent wage increase—10 cents retroactive to April 1, 12½ cents next year and 15 cents the third year.

Jurisdictional Strikes Waning

A significant improvement in the handling of jurisdictional disputes in the construction industry has occurred in the last 12 months.

Speaking in Atlantic City, N. J., last week, Richard J. Mitchell, who heads the industry's voluntary machinery for settling such disputes, said that jurisdictional work stoppages in disputes referred to the National Joint Board have dropped off by 50% this year and that the case load of the board is 30% lower than it was a year ago. Now the board has no backlog of cases.

Mr. Mitchell was one of the participants in an intensive two-day workshop discussion of construction industry problems conducted in Atlantic City of the Building Contractors Association of New Jersey, a 500 member statewide organization headed by Samuel P. Waldron, Jr., of Newark's E. M. Waldron & Co., Inc.

Mr. Mitchell attributed the industry's jurisdictional progress largely to three things: Management and labor are doing a more effective job of resolving disputes at the local level, unions have improved their compliance with board procedure, and jurisdictional agreements between international unions are reducing the union conflicts.

The National Joint Board, of which Mr. Mitchell is full-time chairman, was established voluntarily in May 1948, by contractor groups and AFL-CIO building trades unions to effect orderly settlement of disputes between unions over work assignments. Under a procedure that bans jurisdictional work stoppages, the board issues job decisions in disputes that cannot be resolved under existing decisions.

Noting that the board, to which 1,200 disputes were referred last year, has saved the industry millions of dollars since its inception, Mr. Mitchell stressed the fact that the voluntary procedures of the board can succeed only to the extent they are supported by management and labor.

Jurisdictional disputes, he said, should be viewed as reasonable and normal differences of opinion that should evoke neither shame nor panic. He cautioned against including work assignments in collective bargaining agreements and reminded contractors that work assignments are their responsibility. They should be specific and in accord with existing decisions, he noted, and should remain unchanged once made. When disputes arise, the procedural rules of the Joint Board (available to the trade in what is known as the Blue Book) should be followed.

Mr. Mitchell's emphasis on the need for greater knowledge and understanding as the key to constructive progress was, in turn, the major premise on which the two-day conference of the Building Contractors Association of New Jersey was based.

As a silent commentary on the role of labor, over half of the sessions were devoted to labor problems: collective bargaining legislation, pension and welfare funds, jurisdictional disputes, and application of the Taft-Hartley Act to the construction industry.

Union Work Practice Code Pushed by Plumbers Union

Peter T. Schoemann, president of the plumbers and pipefitters union, last week had an answer for those who have wondered what is being done to put the 10-point work practice code of the building trades unions into effect.

He told contractors attending the annual convention of the Mechanical Contractors Association of America in Los Angeles that compliance with the code is essential to the welfare of the union's members and promised "every possible effort" to make it effective.

"Full consideration given to each of the 10 points," Mr. Schoemann said, "may secure a fat contract for a fair contractor and a union job for a union man." In view of the business downturn and the employment situation today, he observed, their importance cannot be stressed too much at present.

The code condemns featherbedding and other wasteful work practices and seeks to promote the orderly settlement of jurisdictional disputes and grievances without strikes or stoppages. It was adopted as a policy statement last February by top officers of the AFL-CIO building trades unions with the intention that each international union would do its best to see that the code is carried out locally. In a few cases, the code has been incorporated in collective bargaining agreements.

"Year in and year out," Mr. Schoemann said, "we have been losing millions of dollars worth of work to nonunion contractors because of costly working conditions we ourselves have created. For a long time now the United Association (of Plumbers and Pipefitters) has been aiming toward a policy of preventing unjustified practices from hurting our chances of finding work for our members. I feel very strongly that this is a serious duty and responsibility of ours."

Labor Briefs . . .

• **Safety**—A Texas state legislative interim committee has commenced a study of industrial and occupational safety to find out why accidents occur and how they can be prevented. Gov. Price Daniel estimates that 98% of the state's 240,000 accidents a year are preventable.

• **Organizing**—A drive for new members among industrial as well as construction workers has been launched by the painters union, which has appointed O. T. Satre, of Los Angeles, director of organization. Among the targets are prefabrication plants.

OFFICIAL PROPOSALS

Prequalification Date: June 5, 1958

Board of Education
Bureau of Construction

Notice Re:
Prequalification Forms for Contractors
NOTICE IS HEREBY GIVEN THAT

The Superintendent of School Buildings, Bureau of Construction, 4th Floor, Room 407, 42-15 Crescent Street, Long Island City 1, N.Y. will receive applications for prequalification from contractors who may wish to submit bids for the proposed hereinafter specified contracts as follows:

General Construction, Plumbing and Drainage, Heating and Ventilating, Electrical Work and Lighting Fixtures for the New Public School 299 Brooklyn, Evergreen Ave. between Woodbine & Madison Streets.

Prequalification application forms will have to be secured from and must be submitted to the Superintendent of School Buildings, Bureau of Construction, 4th Floor, Room 407, 42-15 Crescent Street, Long Island City 1, N.Y.

Bids when advertised, will be received from prequalified bidders only.

Time for submitting prequalification application by contractors will expire on Tuesday, June 5, 1958.

WILLIAM H. CORREALE
Superintendent of School Buildings,
Design and Construction
City Record—Monday, May 26, 1958
Five (5) Days—26, 27, 28, 29, 31
Dated: May 21, 1958

Bids: June 11, 1958.

Delaware River Port Authority of the Commonwealth of Pennsylvania and the State of New Jersey

Administration Building
Camden, New Jersey
PROPOSAL

Sealed bids will be received for furnishing snow removal equipment and catch-basin cleaning equipment, at the office of the Executive Director of the Delaware River Port Authority, Administration Building, Benjamin Franklin Bridge Plaza, Camden, New Jersey until 2:30 P.M., Eastern Daylight Saving Time, Wednesday, June 11, 1958, at which place and time they will be publicly opened and read by the Authority. The equipment on which bids are requested is as follows:

ITEM No. 1: One new gasoline-operated Snogo, Model MTR with turret loading and casting chute mounted on a new gasoline-operated Four Wheel Drive (FWD) Model KS Snogo Special Chassis, 24,000 G.V.W. Unit to be equipped with turning lights, front and rear, and must comply with Pennsylvania and New Jersey Motor Vehicle Codes. The entire unit shall be finished in DuPont Dulux Automotive Grey, No. 93-23947.
Exclude Pennsylvania Selective and Use Tax.
Exclude Federal Tax.
The price bid shall include delivery to the Maintenance Building, Philadelphia Plaza, Philadelphia, Pennsylvania of the Walt Whitman Bridge.
The bid shall state the delivery time required.

ITEM No. 2: One new gasoline-operated Walter Snow Fighter, Model FGR; 225 h.p.; 42,000 G.V.W. 12:00 x 24 fourteen ply tires, dual rear wheels; 138-inch wheel base; cab to rear axle dimension, 96 inches, complete, including the following snow plow and spreader equipment:
Frink Model 3611-PRT power reversing snow plow, 36" x 11'0" moldboard; deflector shield, power hydraulic lift.
Frink SWR—12 right-hand wing with power hydraulic controls.
Good Roads Model HY hydraulic, chassis mounted spreader, 8 cubic yard capacity, dual spinner discs, individual speed control of the conveyor and spinner, hinged screens for the top of the hopper, tarpaulin, rear fenders, splash shield, catwalks with railings.
Unit to be equipped with turning lights, front and rear, and must comply with Pennsylvania and New Jersey Motor Vehicle codes. The entire unit shall be finished in DuPont Dulux Automotive Grey, No. 93-23947.
Exclude Pennsylvania Selective Sales and Use Tax.
Exclude Federal Tax.
The price bid shall include delivery to the Maintenance Building, Philadelphia Plaza, Philadelphia, Pennsylvania of the Walt Whitman Bridge.
The bid shall state the delivery time required.

ITEM No. 3: One, new, Model "P" Netco catch-basin cleaner with pneumatic controls, fully enclosed cab with doors, one 1½ cu. ft. "orange peel" bucket and one 13" x 19" "clam shell" bucket, complete. The price bid shall include removal of one dump truck body from a Port Authority truck and installation of the catch-basin cleaner by four "U" bolt clamps to permit easy removal of the catch-basin cleaner and replacement of the dump truck body. The dump truck body shall remain the property of the Delaware River Port Authority. The equipment supplied shall be finished in DuPont Dulux Automotive Grey, No. 93-23947.
Exclude Pennsylvania Selective Sales and Use Tax.
Exclude Federal Tax.
The price bid shall include delivery to the Maintenance Building, Philadelphia Plaza, Philadelphia, Pennsylvania of the Walt Whitman Bridge.
The bid shall state the delivery time required.

Separate prices must be stated for each item.

The Authority reserves the right to waive any informalities in the bids received; to reject any or all bids; to award the work in part or in whole; and to award the work to the bidder whose proposal is deemed by the Authority to be most advantageous to the public interest.

DELAWARE RIVER PORT AUTHORITY
Joseph K. Costello
May 21, 1958 Executive Director

U. S. Government

DEPARTMENT OF THE INTERIOR, Bureau of Reclamation. Sealed bids (Specifications No. DC-5061) will be received at Camp White, Oregon until June 24, 1958, for furnishing labor and materials for earthwork and structures, Conde Creek collection canal and Dead Indian collection canal, Rogue River Basin Project, Oregon. Location east of Ashland, Oregon. Principal items are 65,700 cu. yds. excavation; 2,030 cu. yds. riprap and rockfill; 288 cu. yds. concrete in structures; 486 lin. ft. concrete pipe; and other work. Completion time 200 days. For particulars, address Bureau of Reclamation, P. O. Box 386, Camp White, Oregon; or Building 53, Denver Federal Center, Denver 2, Colorado. W. A. Dexheimer, Commissioner.

Department of Commerce, Bureau of Public Roads, June 2, 1958. SEALED BIDS will be received at the office of the Acting Regional Engineer, Bureau of Public Roads, 1440 Columbia Pike, Arlington, Virginia, until 11:00 a.m., D.S.T., JUNE 30, 1958, for Contract 2, Piers and Fenders for Channel Spans, Woodrow Wilson Memorial Bridge over the Potomac River. The pier construction under this contract consists of two land piers on the Virginia Shore, the lower portions of two bascule piers, and six other river piers, and is partially located in the City of Alexandria, Va., partially in the District of Columbia, and partially in Prince Georges County, Maryland. Alternate bids are to be submitted on alternate designs of five of the river piers. The approximate quantities of the more important items are 15,000 cu. yd. of Excavation, 50,000 lin. ft. of Piling for piers (various sizes), 20,000 cu. yd. of Concrete, 1,150,000 lb. of Reinforcement Steel, 500 cu. yd. of Stone Masonry, 20,000 lin. ft. of Creosoted Timber Piling for fenders, and 100 MBM of Creosoted Timber for fenders. Minimum wage rates have been fixed as required by law. Plans, specifications and proposal forms are available upon request at the address given above. R. S. DuBois, Acting Regional Engineer.

Department of Commerce, Bureau of Public Roads, May 26, 1958. SEALED BIDS will be received at the office of the Acting Regional Engineer, Bureau of Public Roads, 1440 Columbia Pike, Arlington, Virginia, until 11:00 a.m., D.S.T., JUNE 30, 1958, for Contract 3A, superstructure steelwork, machinery and electrical equipment for the channel spans of the Woodrow Wilson Memorial Bridge over the Potomac River. The channel spans comprise a four leaf bascule span and four approach spans on each side of the bascule span, having a total length of 1,490 ft. A portion of this length is located in each of the following: City of Alexandria, Va., District of Columbia, and Prince Georges County, Maryland. The approximate quantities of the more important items are 7,100,000 lb. of structural carbon steel, 1,030,000 lb. of structural alloy steel, and 450,000 lb. of machinery. The last item and the item of electrical equipment will be lump sum items. Minimum wage rates have been fixed as required by law. Plans, specifications and proposal forms are available upon request at the address given above. R. S. DuBois, Acting Regional Engineer.

OFFICIAL PROPOSALS

RATE: The rate for Official Proposal advertising is $2.40 per line or fraction set solid. Where the advertisement is set other than solid, the space is measured by total space occupied and charged on basis of 12 lines to the inch.

CLOSING DATE: Friday 10:30 A.M. for issue dated the following Thursday.

SEND COPY TO: Official Proposal Division, Engineering News-Record Class. Adv. Div., P. O. Box 12, N. Y. 36, N. Y.

Bids: June 5, 1958.

New York State Road Work

NOTICE TO CONTRACTORS: STATE DEPARTMENT OF PUBLIC WORKS, ALBANY, N. Y.,—Pursuant to the provisions of the Highway Law, and special provisions for projects financed with Federal Aid Funds, sealed proposals will be received until ten-thirty o'clock A.M., eastern standard time on the 5th day of June 1958, by Henry A. Cohen, Director, Bureau of Contracts, 14th Floor, The Governor Alfred E. Smith State Office Building, Albany, N. Y., for the following Projects:

County	Contract No.	Name	Miles	Type	Deposit	Estimated Cost of Work
DISTRICT No. 2, L. KETCHUM, District Engineer, 109 No. Genesee Street, Utica 1, New York						
Oneida	FAC 58-7 FASH 58-4	City of Rome: East Whitesboro St. Arterial City of Rome: Southerly Hwy. Connections Project U-UG-693(4), U-156(4)	3.98 (5.55 Acc.)	9" Cem. Conc. Pavt. = 3.07 Mi. Asph. Conc. Pavt. = 0.91 Mi. 3 H.G.S. Comp. I-Beam 154.5', 137', 129' 1 Rrgs 384.5'; 1 Br. Girder & Comp. I-Beam 585.7' 1 Hgs Reinf. Conc. 36'	$375,000 Plans $20	$6,864,000
DISTRICT No. 3, E. E. TOWLSON, Acting District Engineer, 333 E. Washington St., Syracuse, New York						
Cortland, Oswego, Onondaga, Tompkins, & Wayne	RC 58-39	9 Various Highways in District No. 3	25.36	Subsealing Cement Concrete Pavement	$18,000 Plans $2	$336,000
DISTRICT No. 4, B. F. PERRY, District Engineer, Barge Canal Terminal, Rochester 1, New York						
Genesee (Rte. 19)	FARC 58-28	Le Roy-Pavilion, Pt. 1, S.H. 5538 Le Roy-Pavilion, S.H. 5582A Le Roy-Pavilion, Pt. 2, S.H. 5582 Project DF-1004(2)	7.68 (0.38 Acc.)	Asph. Conc = 7.68 Mi. Including Bridge Repairs	$45,000 Plans $5	$831,000
Monroe (Rte. 18)	FARC 58-38	Barnard Crossing, Pts. 1 & 2, S.H. 276 Project Dus-433(2)	1.17	Asph. Conc. = 1.16 Mi. Misc. Work = 0.01 Mi.	$12,000 Plans $2	$211,000
DISTRICT No. 5, E. G. H. YOUNGMANN, District Engineer, State Office Bldg., 65 Court Street, Buffalo 2, New York						
Niagara (Rte. 18F & 104)	FARC 58-50	Lewiston-Youngstown, S.H. 5306 Lewiston Village-Center St., S.H. 1724 Lewiston-Dickersonville, S.H. 617 Project DS-492(1)	1.49	Asph. Conc. = 1.39 Mi. Misc. Work = 0.10 Mi.	$20,000 Plans $2	370,000
Erie (Rte. 5)	FARC 58-35	Lackawanna City, South, S.H. 5071 Lake Shore-Lackawanna City, S.H. 5019 Project DU-750(13)	0.58	Asph. Conc., Ty. 2A = 0.49 Mi. Misc. Work = 0.09 Mi.	$20,000 Plans $2	362,000
Erie & Cattaraugus	FASS 58-7	Johnsons Corners-Sardinia, C. R. 225 & 225A Yorkshire Corners-Sardinia Rd., C.R. 72 Project S-456(1)	1.17	Stab. Gravel-Mixed = 1.14 Mi. Asph. Conc. Ty. 2B (Br.) = 0.03 Mi. Including Pres. Conc. Br. 3 Spans 60' Each	$20,000 Plans $2	$378,000
Niagara	FAC 58-8	City of Niagara Falls Arterial Route (Walnut Ave. and Ferry Ave.) Project Du-500(10)	4.11	Traffic Signal System	$6,000 Plans $2	$111,000
DISTRICT No. 6, J. H. THOMAS, District Engineer, State Office Bldg., 30 West Main Street, Hornell, New York						
Alleghany	RC 58-43	Black Creek-Belfast, PSC 4652, S.H. 8529 Belvidere-Transit Bridge-Angelica, Br. No. 2, S.H. 1260 Belmont-Phillips Creek, Pt. 1, Br. No. 1, S.H. 1559	....	Cleaning & Painting 3 Bridges	$900 Plans $2	$16,000
Alleghany (Rte. 17)	FARC 58-37	Bolivar-Wellsville, Pt. 2, S.H. 8253 Project DF-421(8)	0.05	Bridge Repair	$4,000 Plans $2	$75,000
Schuyler & Yates (Rte. 14)	FARC 58-44	Gabriels Corners-Starkey, Pt. 2, S.H. 8399 Starkey-Dresden, Pt. 1, S.H. 8399 Starkey-Dresden, Pt. 2, S.H. 8353 Project F-505(7)	10.52	Asph. Conc. = 10.47 Mi. Misc. Work = 0.05 Mi. Including Widen Br. 3-Pl. Girder 411.1' Widen Br. 4-Pl. Girder & Truss—485.7'	$125,000 Plans $10	$2,280,000
DISTRICT No. 7, R. W. SWEET, District Engineer, 444 Van Duzee Street, Watertown, New York						
St. Lawrence (Rte. 3)	FARC 58-41	Cranberry Lake-Seveys Corners, S.H. 8220 Franklin County Line-Seveys Corners, S.H. 8241 Project DF-382(7), DF-386(5)	1.41	Asph. Conc., Ty. 1A Including Br. No. 2 Twin Reinf. Conc. Closed Box Span 20' Each	$20,000 Plans $3	$372,000
Franklin	RC 58-48	Chateaugay-Clinton Co. Line, Br. No. 1, S.H. 5468 St. Regis Indian Reservation-Fort Covington, Br. No. 3, S.H. 1659 Hogansburg-Bombay, Br. No. 1, S.H. 820	....	Cleaning and Painting 3 Bridges	$1,000 Plans $2	$19,000
DISTRICT No. 8, K. G. RAUER, District Engineer, Pleasant Valley Road, Poughkeepsie, New York						
Columbia (Rte. 9)	FARC 58-45	Livingston-Hudson, Pt. 1, S.H. 5072 Project DF-322(15)	3.46	Asphalt Concrete	$12,000 Plans $2	$212,000
Orange	PIP 58-1	Palisades Interstate Parkway, Sect. 1. (Queensboro Interchange)	0.67 (1.17 Acc.)	Cem. Conc. Pavt. with Carbon Blk. = 1.28 Mi. Misc. Work = 0.56 Mi. Including Hgs Comp. I-Beam 2 Spans Total 159.3' HGS R.C. Rigid Frame 59.4' Br. Twin R.C. Closed Box 15' Ea.	$80,000 Plans $5	$1,441,000
Rockland (Rte. 59)	FGRC 58-52	Knapps Corners-Nyack, S.H. 5178 Project Du-Dug-1096(3)	0.91	9" Reinf. Conc. Pavt. = 0.72 Mi. Asph. Conc. Ty. 2B = 0.09 Mi. Misc. Work = 0.10 Mi. Hgs & Rrgs Pres. Conc. Beam 322' Br. Pres. Conc. Beam 132'	$85,000 Plans $5	$1,170,000
Orange (Rte. 17)	RC 58-2	Palisades Interstate Park-Goshen, Pt. 3, FASH 53-7	0.44	Asphalt Concrete	$9,000 Plans $3	$159,000
Westchester	FINET 58-1 NET 58-2	New York State Thruway-New England Sect., Subdivisions 1, 2, 2A, 3, 4, 5 Project I-1068(16)	11.31	Chain Link Fencing Stabilized Bit. Shoulders Lighting Conduit System	$95,000 Plans $3	$1,613,000
DISTRICT No. 9, J. C. FEDERICK, District Engineer, 71 Frederick Street, Binghamton, New						
Chenango (Rte. 7)	FARC 58-42	York Afton-Bainbridge, S.H. 8075 Afton-Bainbridge, S.H. 5261 Project DF-360(10)	2.49	Asphalt Concrete Including Bridge Widening	$23,000 Plans $2	$402,000
DISTRICT No. 10, M. E. GOUL, District Engineer, 325 W. Main Street, Babylon, L. I., New						
New York	FAHRD 58-1	York Harlem River Drive, Cont. 145A (West 145th St. to Seventh Ave.) Project U-UG-1133(2)	0.50	Asph. Conc = 0.48 Mi. Cem. Conc. Pavt. = 0.02 Mi. on Reinf. Conc. Slab and Pres. Conc. Viaduct	$280,000 Plans $20	$5,123,000
Suffolk	FASH 58-5	Sunrise Highway Extension, Cont. 1. (Phyllis Drive to Yaphank Ave.) Project DU-947(13)	6.82 (7.00 Acc.)	9" Cem. Conc. Pavt. = 4.46 Mi. Demolition = 2.16 Mi. Misc. Work = 0.20 Mi. Including 2 Hgs Comp. WF Beam 4 Spans @ 212 Tot. 4 Spans @ 212.3' Tot. Hgs Comp. Welded Pl. Girder 4 Spans 329.5' Tot.	$260,000 Plans $10	$4,724,000
Suffolk	FARC 58-57	Mattituck-Greenport, Pts. 1 & 3, S.H. 8229	2.62	Asph. Conc. = 2.49 Mi.	$42,000	$766,000
(Pte. 25)	FARC 58-57	Mattituck-Greenport, Pt. 4, S.H. 1719 Proj. DF-348(8)		Misc. Work = 0.13 Mi.	Plans $3	

Any projects in this letting that are on the Federal Aid highway systems are subject to the provisions of the "Federal-Aid Highway Act of 1956", being Public Law 627, 84th Congress, approved June 29, 1956, and are also subject to the applicable New York State statutes.

In compliance with the provisions of Section 115 (Prevailing Rate of Wage) Public Law 627, the minimum wages to be paid laborers and mechanics are included in wage schedules that are set out in the bid proposal.

Maps, plans, specifications and proposal forms may be seen and obtained at the office of the State Department of Public Works, Bureau of Contracts, Albany, N. Y., and at the office of the District Engineers noted above, and may also be seen at the office of the State Department of Public Works, 270 Broadway, New York City.

The deposit for Plans and Proposal Forms for each contract is indicated above. A refund will be made in full to bidders for return of one set, in good condition, within 30 days of award, or rejection of bids; refund for all other sets in good condition, similar period, will be 50% of deposit.

Special attention of bidders is called to "Information for Bidders" in the Public Works Specifications, and to the special provisions applying to projects financed with federal funds. Award of a contract is subject to priorities and allocations under the Defense Production Act of 1950, as amended, and all regulations issued thereunder.

Proposal for each contract must be submitted in a separate sealed envelope with the name and number of the contract plainly endorsed on the outside of the envelope. Each proposal must be accompanied by draft or certified check payable to the order of the "State of New York, Commissioner of Taxation and Finance" for the sum as specified in the advertisement and the proposal. The retention and disposal of the bidding check, the execution of the contract and bonds shall conform to the provisions of the Highway Laws, as set forth in "Information for Bidders".

The right is reserved to reject any or all bids.

JOHN W. JOHNSON

SUPT. OF PUBLIC WORKS

OFFICIAL PROPOSALS

Bids: June 10, 1958.

Power Authority of the State of New York

ADVERTISEMENT FOR PROPOSALS
For Planting of Specimen Trees and Shrubs During 1958, 1959 and 1960
In Construction Areas and State Park
St. Lawrence County, New York
Specifications No. PA-5-11042
St. Lawrence Contract No. 48

NOTICE TO CONTRACTORS: The POWER AUTHORITY OF THE STATE OF NEW YORK will receive sealed proposals for Planting of Specimen Trees and Shrubs during 1958, 1959 and 1960 in Construction Areas and State Park, St. Lawrence County, New York, until 10:30 A. M., Eastern Daylight Savings Time on the 10th day of June, 1958 at the Authority's office, 18th Floor, the Coliseum Tower, 10 Columbus Circle, New York 19, New York, at which time and place the proposals will be publicly opened and read aloud.

The estimated quantities of work are:

Furnishing and planting specimen deciduous trees	1,790 trees
Furnishing and planting specimen evergreen trees	1,350 trees
Furnishing and planting deciduous and evergreen shrubs	9,240 shrubs
Furnishing and planting vines and ground cover plants	14,600 plants

All of the work shall be completed on or before July 15, 1960.

Plans, Specifications and Proposal Forms for the work, may be obtained from the Power Authority of the State of New York, at the 18th Floor, the Coliseum Tower, 10 Columbus Circle, New York 19, New York, upon application and prepayment of a fee of Ten Dollars ($10.00) per initial set of contract documents and Five Dollars ($5.00) per set for additional sets, no part of which will be refunded. Plans, Specifications and Proposal Forms for the work will be on file in the Authority's office and in the offices of the Engineer, Uhl, Hall & Rich, 230 Congress Street, Boston 10, Massachusetts, and The Hydro-Electric Power Commission of Ontario, 620 University Avenue, Toronto 2, Ontario, and may be inspected by prospective bidders during office hours.

Bids must be made in duplicate in accordance with the instructions contained in the Information for Bidders. Guarantee will be required with each bid in an amount not less than 20 percent of the gross sum bid.

The right is reserved to reject any or all bids.

W. S. Chapin
General Manager

Bids: June 17, 1958

Triborough Bridge and Tunnel Authority

SEALED BIDS WILL BE RECEIVED BY Triborough Bridge and Tunnel Authority at its office, Administration Building, Randall's Island, Manhattan, New York 35, N. Y., as follows:
Until 11 A.M. on Tuesday, June 17, 1958
For Throgs Neck Bridge Contract No. TN-10A, Bronx Approach Substructure. The bid must be accompanied by a deposit in the amount of $200,000.00
and
For Throgs Neck Bridge Contract No. TN-10B, Queens Approach Substructure. The bid must be accompanied by a deposit in the amount of $200,000.00.

Bidders may submit bid for either one or both of the above contracts.

Plans, specifications and contract documents may be purchased at the office of the Authority for $30.00, which will not be refunded.

U. S. Government

DEPARTMENT OF THE INTERIOR, Bureau of Reclamation. Sealed bids (Specifications No. DC-5060) will be received at Albuquerque, New Mexico, until June 26, 1958, for furnishing labor and materials for earthwork, clearing, and structures for irrigation rehabilitation, Belen Unit 11, Middle Rio Grande Project, New Mexico. Location near Belen, New Mexico. Principal items are cleaning about 10 miles of waterways; 25,800 cu. yds. excavation from borrow; 103 turnouts, construction of farm turnouts; 2,730 lin. ft. concrete and corrugated-metal pipe, 10- to 36-inch; and other work. Completion time to March 15, 1959. For particulars, address Bureau of Reclamation, P. O. Box 252, Albuquerque, New Mexico; or Building 53, Denver Federal Center, Denver 2, Colorado. W. A. Dexheimer, Commissioner.

Bids: June 18, 1958

Triborough Bridge and Tunnel Authority

SEALED BIDS WILL BE RECEIVED BY Triborough Bridge and Tunnel Authority at its office, Administration Building, Randall's Island, Manhattan, New York 35, N. Y., as follows:
Until 11 A.M. on Wednesday, June 18, 1958
For Throgs Neck Bridge Contract No. TN-10C, Bronx Approach Superstructure Steel. The bid must be accompanied by a deposit in the amount of $250,000.00
and
For Throgs Neck Bridge Contract No. TN-10D, Queens Approach Superstructure Steel. The bid must be accompanied by a deposit in the amount of $250,000.00.

Bidders may submit bid for either one or both of the above contracts.

Plans, specifications and contract documents may be purchased at the office of the Authority for $30.00, which will not be refunded.

Bids: June 24, 1958

Bids for U. S. Army Corps of Engineers Construction Goose Air Base, Goose Bay, Labrador, Canada

Invitation for Bids ENG-30-347-58-13 for construction of Buildings and Utilities consisting of a two-story reinforced concrete and concrete block Readiness Crew Building; two three-story reinforced concrete frame Civilian Dormitories; and two one-story, steel frame Shop Buildings with concrete block walls at GOOSE AIR BASE, GOOSE BAY, LABRADOR, CANADA.

ESTIMATED COST—Over $2,500,000.

SEALED BIDS in duplicate and plainly marked will be received in the office of DEFENCE CONSTRUCTION (1951) LIMITED, Tender Opening Room, No. 4 Temporary Building, 56 Lyon Street, Ottawa, Ontario, until 3:00 P.M., Eastern Daylight Saving Time,

TUESDAY, 24 JUNE 1958

BID FORMS, PLANS AND SPECIFICATIONS may be obtained by bona fide bidders from the District Engineer, U. S. Army Engineer District, Eastern Ocean, 346 Broadway, New York 13, N. Y. A deposit of $50.00 made payable to "Treasurer of the United States" is required for each set of plans and specifications, limited to a maximum of three sets to any one bidder. Such deposits will be refunded upon the return, in good condition, of said plans and specifications to issuing office within 15 days after date of closing of bid.

PLANS AND SPECIFICATIONS WILL BE ON VIEW at the office of the District Engineer, U. S. Army Engineer District, Eastern Ocean, 346 Broadway, New York 13, N. Y.

VISITS TO THE PROJECT SITE can be arranged through the District Engineer, U. S. Engineer District, Eastern Ocean, 346 Broadway, New York 13, N. Y.

Bids: June 11, 1958.

Contractors' Notice of Texas Highway Construction

Sealed proposals for constructing 14.502 miles of Gra., Strs. Shell Conc. Base & Hot Mix Asph. Conc. Pavt. from FM 1406 to SH 61 on Highway No. IH 10 FM 1724 covered by I 10-8(24)821, in Chambers County, will be received at the Highway Department, Austin, until 9:00 A.M., June 11, 1958, and then publicly opened and read.

This is a "Public Works" Project, as defined in House Bill No. 54 of the 43rd Legislature of the State of Texas and House Bill No. 115 of the 44th Legislature of the State of Texas, and as such is subject to the provisions of said House Bills.

This is also a Federal-aid project located on the Interstate Highway System and is subject to the provisions of the Federal-Aid Highway Act of 1956. No provisions herein are intended to be in conflict with the provisions of said Acts.

Minimum wage rates for this project have been predetermined as required by Law and are set forth in the bid Proposal.

Legal holiday work shall be paid for at the regular governing rates.

Plans and specifications available at the office of D. W. Syphrett Resident Engineer, Anahuac, Texas, and Texas Highway Department, Austin. Usual rights reserved.

BIDS: June 19, 1958

Erie County Water Authority

Notice is hereby given that sealed bids will be received in accordance with the law by the Erie County Water Authority until 10:30 o'clock A.M. Eastern Daylight Saving Time on the nineteenth day of June, 1958 at the office of the Authority, 338 Ellicott Square Building, Buffalo 3, New York, for furnishing materials and performing the labor for constructing the intake and intake tunnel for the Sturgeon Point Filtration Plant at Sturgeon Point, Town of Evans, Erie County, New York, all in accordance with plans and specifications prepared by Buck, Seifert and Jost, Consulting Engineers, 112 East 19th Street, New York 3, New York.

Copies of the plans and specifications may be examined without charge at the office of the Erie County Water Authority or at the office of the Consulting Engineers. Copies thereof may be obtained at either office upon deposit of Thirty ($30.00) Dollars, which sum will be refunded upon return of the plans and specifications in good condition within thirty (30) days after the date on which bids are received or else the entire deposit will be forfeited.

The work to be done includes furnishing all materials and labor, tools, plant and equipment necessary for constructing complete a water supply tunnel approximately three thousand (3,000') feet long extending beneath Lake Erie, a timber intake crib with an intake shaft at the Lake end, a combined intake shaft and distribution chamber for the low lift pumping station at the shore end and for performing the excavation for the low lift pumping station.

Each proposal must be accompanied by a certified check payable to the Erie County Water Authority or a bid bond to the favor of the Authority from a reliable surety company authorized to do business in the State of New York and satisfactory to the Authority, in amount equal to ten (10%) percent of the proposal. The certified check will be retained to pay for any damage or loss to the Authority, or the liability bond will accrue, in case the successful bidder shall neglect or refuse to enter into a contract in accordance with his proposal.

The Authority reserves the right to consider bids for forty-five (45) days after their receipt before awarding any contract and the right is reserved to accept any bid or to reject any or all of them.

The Authority has submitted applications for permits to construct the project to various Federal and State Authorities having jurisdiction and the Contract will not be executed by the Authority until these permits are issued.

ERIE COUNTY WATER AUTHORITY
By: WILLIAM J. CARNEY
Secretary
Buck, Seifert and Jost
Consulting Engineers
Dated: May 22, 1958

Prequalification Date: June 2, 1958

Board of Education—Bureau of Construction Notice Re: Prequalification Forms for Contractors

NOTICE IS HEREBY GIVEN THAT The Superintendent of School Buildings, Bureau of Construction, 4th Floor, Room 407, 42-15 Crescent Street, Long Island City 1, N. Y. will receive applications for prequalification from contractors who may wish to submit bids for the proposed hereinafter specified contracts as follows:
General Construction, Plumbing and Drainage, Heating and Ventilating, Electrical Work and Lighting Fixtures for the New Athletic Field at the Martin Van Buren High School, Queens Hillside Avenue and 232nd Street, Queens Village.
Prequalification application forms will have to be secured from and must be submitted to the Superintendent of School Buildings, Bureau of Construction, 4th Floor, Room 407, 42-15 Crescent Street, Long Island City 1, N. Y.
Bids when advertised, will be received from prequalified bidders only.
Time for submitting prequalification application by contractors will expire on Monday, June 2, 1958.
WILLIAM H. CORREALE
Superintendent of School Buildings,
Design and Construction
Dated: May 16th, 1958
City Record-Wednesday, June 21, 1958
Five (5) Days—21, 22, 23, 24, 26.

OFFICIAL PROPOSALS

Bids: June 24, 1958

Contract GWB-190.031
The Port of New York Authority
George Washington Bridge
Lower Level Expansion
Temporary Emergency Garage

Sealed proposals for the construction of a temporary emergency garage at Fort Lee, New Jersey, will be received at the office of the Chief Engineer of The Port of New York Authority, Room 1100, 111 Eighth Avenue, New York 11, N. Y., until 2:30 P.M. on Tuesday, June 24, 1958, at which time said proposals will be opened and read in Room 1108.

Contract documents may be seen at the office of the Engineer of Design of the Authority, Room 1115. Documents will be furnished upon deposit of $30.00 per set for not more than three sets to any one company (each set including one copy of the contract drawings). Additional sets will be furnished upon payment of $30.00 per set, which payment is not returnable. Deposits and payments shall be delivered to the Treasury Department, Room 1001, where a receipt will be issued. The receipt shall be delivered to Room 1115, where the documents will be furnished.

Those who have submitted a bid on the contract will receive a refund of the deposit for each set of documents, not exceeding three, returned within forty days after the opening of proposals. Those who have not submitted a bid will receive a refund of one-half of the deposit for each set of documents, not exceeding three, returned within forty days after the opening of proposals.

THE PORT OF NEW YORK AUTHORITY
Donald V. Lowe, Chairman

New York, May 29, 1958

Bids: June 19, 1958

Advertisement for Proposals
for Channel Improvement in
Tailrace Area at
Barnhart Island Power Plant
St. Lawrence County, New York
Specifications No. PA-5-11038
St. Lawrence Contract No. 47

NOTICE TO CONTRACTORS: THE POWER AUTHORITY OF THE STATE OF NEW YORK will receive sealed proposals for Channel Improvement in Tailrace Area at Barnhart Island Power Plant, St. Lawrence County, New York, until 10:30 A.M. Eastern Daylight Saving Time on the 19th day of June, 1958, at the Authority's office, 18th Floor, The Coliseum Tower, 10 Columbus Circle, New York 19, New York, at which time and place the proposals will be publicly opened and read aloud.

The estimated quantity of the principal item of work consists of 3,050,000 cubic yards of common excavation in the channel of the St. Lawrence River below the Barnhart Island Power Plant.

All work shall be completed on or before July 1, 1960.

Plans, Specifications and Proposal Forms for the work may be obtained from the Power Authority of the State of New York, at the 18th Floor, the Coliseum Tower, 10 Columbus Circle, New York 19, New York, upon application and prepayment of a fee of Twenty Dollars ($20.00) per initial set of contract documents, and Ten Dollars ($10.00) per set for additional sets, no part of which will be refunded. Plans, Specifications and Proposal Forms for the work will be on file in the Authority's office and in

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OFFICIAL PROPOSALS

the offices of the Engineer, Uhl, Hall & Rich, 230 Congress Street, Boston 10, Massachusetts, and The Hydro-Electric Power Commission of Ontario, 620 University Avenue, Toronto 2, Ontario, and may be inspected by prospective bidders during office hours.

Bids must be made in duplicate in accordance with instructions contained in the Information for Bidders. Guarantee will be required with each bid in an amount not less than 20 percent of the maximum price bid for any bid schedule.

The right is reserved to make award on either one of the schedules, and to reject any or all bids.

W. S. CHAPIN
GENERAL MANAGER

Bids: June 24, 1958

Davenport Bridge Commission
Contract No. 2

SUPERSTRUCTURE FOR THE EXPANSION AND IMPROVEMENT OF THE
IOWA-ILLINOIS MEMORIAL BRDGE
Over the Mississippi River Between Bettendorf, Iowa and Moline, Illinois
INVITATION TO TENDER

The Davenport Bridge Commission of the City of Davenport, Iowa, invites proposals for the construction of the superstructure, toll plaza and administrative facilities for the expansion and improvement of the Iowa-Illinois Memorial Bridge over the Mississippi River between Bettendorf, Iowa, and Moline, Illinois. Sealed proposals for the Work described below will be received by the Davenport Bridge Commission in the office of Mayor, City Hall, Davenport, Iowa, until 10:00 A.M. Central Standard Time, June 24, 1958, at which time the proposals will be publicly opened and read.

This Contract No. 2 consists of the furnishing of all materials for and the construction of all metalwork in the superstructure and the paving of all roadways, curbs and safety walks between the abutment in Bettendorf, Iowa, and the abutment in Moline, Illinois, for the new two-lane structure and reconstructed toll plaza area at the Moline Anchorage, together with the furnishing and installing of the complete roadway lighting system on the new structure and the approach ramps and streets, alterations to the existing aerial and navigation lighting, the completion of the upper portions, above Line Z-Z shown on the Plans, of both the Bettendorf and Moline Anchorages including the finishing of the interior of the New Moline Anchorage and the remodeling of the existing Moline Anchorage for administrative facilities, and the reconstruction and expansion of the canopies and houses on the toll plaza (exclusive of toll registers), all "ready to receive traffic", and other incidental construction, all for a second two-lane highway bridge adjacent to and approximately 72 feet downstream from the existing Iowa-Illinois Memorial Bridge, throughout similar in construction to such existing bridge, together with improvements of the approaches at the entrances to the bridge and the widening and improvement of the toll plaza and administrative facilities at the Moline Anchorage, to provide upon completion of the entire project, together with the existing bridge, a four-lane divided highway facility approximately 5505 feet in length. All work is to be accomplished without interruption to the two-lane traffic on the existing bridge.

A fuller description of the work to be done and of the requirements, provisions and details thereof is given in the Contract Drawings and Specifications, copies of which are on display in the office of the Mayor of the City of Davenport, Iowa; in the office of the Resident Engineer, 1429 State Street, Bettendorf, Iowa; and in the offices of the Engineers, Modjeski and Masters, Sixth Street at Forster, Harrisburg, Pennsylvania, or may be obtained from the latter office upon deposit of Twenty Dollars ($20.00) per set. Deposit checks shall be made payable to Modjeski and Masters.

Deposits of all bona fide Bidders will be refunded upon return of documents in good condition within ten (10) days after receipt of bids. All other deposits will be retained.

No proposal will be received unless accompanied by a certified check satisfactory to the Commission drawn upon a National Bank organized under the laws of the United States or upon a State or Savings Bank or Trust Company organized under the laws of the State of Iowa, and in any case having an office or place of business in the State of Iowa, and payable to the order of the Davenport Bridge Commission

OFFICIAL PROPOSALS

for the sum of Two Hundred Twenty-five Thousand Dollars ($225,000) as security for the proper execution of the Contract. Such check must not be enclosed in the sealed envelope containing the bid but must be delivered to the office of the Mayor. Receipt for the deposit will be given by the Commission.

The Commission reserves the right to waive any informalities in the bids received; to reject any or all bids; to award the Contract only to those experienced in this class of work and to the Bidder whose proposal is deemed by the Commission to be most advantageous to the public interest. The provisions of the above Invitation to Tender are made for the benefit of the Commission and no right shall be deemed to accrue to any person making a proposal by reason of the submission of any proposal hereunder or by the waiver or non-enforcement of any provision or requirement of the Invitation.

DAVENPORT BRIDGE COMMISSION
DAVENPORT, IOWA
Secretary

Dated: May 20, 1958

(Mailing Address:
P.O. Box 719
Davenport, Iowa)

U. S. Government

Bids: June 24, 1958

Bids for
U. S. Army Corps of Engineers
Construction
E. Harmon Air Force Base,
Newfoundland, Canada

Invitation for Bids ENG-30-347-58-14 for construction of Buildings and Utilities consisting of a one-story, Air Passenger Terminal of steel frame with cavity walls of concrete masonry units and brick; a one-story Power Equipment Shop Building of steel frame with concrete block walls; a one-story Squadron Operations Building; a one-story Operation Mission Training Building of concrete block bearing walls; a two-story Readiness Crew Building of reinforced concrete and concrete block bearing walls, one-half story below grade; and a one-story Readiness Aircraft Shelter of prefabricated steel structure with corrugated metal siding and roofing at E. HARMON AIR FORCE BASE, NEWFOUNDLAND, CANADA.

ESTIMATED COST—Over $2,000,000.

SEALED BIDS in duplicate and plainly marked will be received in the office of DEFENCE CONSTRUCTION (1951) LIMITED, Tender Opening Room, No. 4 Temporary Building, 65 Lyon Street, Ottawa, Ontario, until 10:00 A.M., Eastern Daylight Saving Time.

TUESDAY, 24 JUNE 1958

BID FORMS, PLANS AND SPECIFICATIONS may be obtained by bona fide bidders from the District Engineer, U. S. Army Engineer District, Eastern Ocean, 346 Broadway, New York 13, N. Y. A deposit of $50.00 made payable to "Treasurer of the United States" is required for each set of plans and specifications, limited to a maximum of three sets to any one bidder. Such deposits will be refunded upon the return, in good condition, of said plans and specifications to issuing office within 15 days after date of closing of bid.

PLANS AND SPECIFICATIONS WILL BE ON VIEW at the office of the District Engineer, U. S. Army Engineer District, Eastern Ocean, 346 Broadway, New York 13, N. Y.

VISITS TO THE PROJECT SITE can be arranged through the District Engineer, U. S. Army Engineer District, Eastern Ocean, 346 Broadway, New York 13, N. Y.

DEPARTMENT OF THE INTERIOR, Bureau of Reclamation. Sealed bids (Specifications No. DC-5058) will be received at Albuquerque, New Mexico, until June 24, 1958, for furnishing labor and materials for earthwork, clearing, and structures for irrigation rehabilitation, Belen Unit 9, Middle Rio Grande Project, New Mexico. Location near Belen, New Mexico. Principal items are cleaning about 10 miles of waterways; 24,000 cu. yds. excavation from borrow; 87 turnouts, constructing farm turnouts; 2,780 lin. ft. concrete and corrugated-metal pipe, 10- to 48-inch; and other work. Completion time to March 15, 1959. For particulars, address Bureau of Reclamation, P. O. Box 252, Albuquerque, New Mexico; or Building 53, Denver Federal Center, Denver 2, Colorado. W. A. Dexheimer, Commissioner.

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Wanted: Engineer Estimator, Missouri General Contractor, work in home office estimating heavy and highways, including bridges, airports, dams, earth and concrete. Experienced estimator only need apply. Salary open as to qualifications. P-7920, Engineering News-Record.

Graduate civil or architectural engineer with professional license or equivalent qualifications. Substantial experience in building design and construction or in structural research together with ability to prepare technical publications. Position open is that of design engineer with a National trade association in Chicago. Good starting salary. Please furnish photo and complete resume, including salary desired, in first letter. P-8017, Engineering News-Record.

General Superintendent—Mid-West General Construction firm engaged in Commercial, Industrial, Public Works, Sewers, Bridges, Dams and Reservoirs has opening for qualified general superintendent. Applicants should have experience and be capable of coordinating all types of above work. Complete experience and education data, references and salary expected should be furnished in first reply. P-8023, Engineering News-Record.

Wanted—Structural Designers and Draftsmen experienced on reinforced concrete and structural steel work, Engineering Firm San Francisco, Calif. Write stating age, education and experience. P-8030, Engineering News-Record.

Have opening for several recent Civil Engineer Graduates with military obligations completed who desire to learn the construction business. Must be ambitious, aggressive, use no intoxicants, preferably single, willing to start in the field on industrial buildings and heavy construction, and willing to move. We operate throughout Kansas and adjacent states. Our organization offers excellent opportunity for advancement. We pay top wages. Martin K. Eby Constr. Co., Inc., P. O. Box 1679, Wichita, Kansas.

• POSITONS VACANT

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Engineer, sanitary background preferably with consulting firm, thirty years age, for position with firm having diversified activity here and abroad. P-8093, Engineering News-Record.

Concrete Engineer for mix design. Capable of supervising Material Testing Laboratory for work in southern Idaho. Ample relocation allowances. Send resume to F. C. Torkelson Company, Box 185, Idaho Falls, Idaho.

Estimators—Engineers: Experienced in buildings and general contracting. Permanent positions with General Contractor operating nationwide doing sizable jobs. Salary commensurate with experience and ability. Location—Texas. Give full details covering education, experience, references, salary and personal data. P-8091, Engineering News-Record.

Associate and Assistant Professors for fields of advanced dynamics, advanced strength, and elasticity. Also have opening for graduate student as half-time instructor. Engineering Mechanics Dept., Kansas University, Lawrence, Kansas.

• POSITIONS WANTED

Project Director, General Manager, 39, heavy construction Govt. and State, Florida highway construction 12 yrs estimating and field experience, graduate engineer and now employed. PW-7915, Engineering News-Record.

Reinforcing Steel Detailer—Estimator with 20 years experience available. PW-7914, Engineering News-Record.

E.E: Fifty-six, married, no children, excellent health. Experience principally in field or reviewing plans and specifications including estimating and bidding for contractor. Covers dist Trans., indus., projects, hydro-installations. Design. No finish board work. PW-7955, Engineering News-Record.

Construction Superintendent engineering background 45, 20 yrs exp in heavy construction & building trades in chemical, atomic, hydroelectric plants. Earthrock fills & electronics R.R. yds. Will travel anywhere. PW-7991, Engineering News-Record.

Project Manager or Superintendent for architect or contractor available. Recently completed luxury type 325 room El San Juan Hotel. Working knowledge Spanish and French. Also experienced heavy construction and housing. Age 44, single. Airmail replies to: Allen McSherry, P. O. Box 1215, San Juan, Puerto Rico.

Chief Estimator, General Construct. available. Public Works, Industrial, Buildings. Prefers NYC home office. Will travel. References. PW-8021, Engineering News-Record.

Concrete—Soils—Utilities Construction, 15 years active & supervisory experience with Engineers, Contractors & Testing Laboratories. Concrete design, production & control; Soils testing & selection large earthwork projects; Contractor's Asst. drainage & earthworks jobs. Adaptable to project-public relations duties; Good references and performance record. J. P. Wallace, Box 6023, Corpus Christi, Texas.

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Civil Engineer; Graduate, 37, married, one child. 12 yrs diversified exp. in design, planning, estimating, cost, construction, in field & office. Also have Cert. in Bus. Admin. & Finance, exp. in Business & Securities, Principles & Operations. Desire opportunity for responsible position, where my exp. & background will be utilized to a mutual advantage. Top references given; prefer N. Y. area. Min salary considered $10,000/yr. PW-8095, Engineering News-Record.

Mechanical Engineer, 33 aggressive, able, honest—10 years experience in oil, chemical, pharmaceutical and marine industries (USA, Far/Middle/Near East, Europe) desires responsible overseas position. Well traveled, linguist. Excellent knowledge of Eastern people, customs and political affairs. PW-8078, Engineering News-Record.

Accountant Field—Management Level—18 years heavy construction. Available New York interview thru June fifteenth. Purchasing, Cost, Insurances. PW-8075, Engineering News-Record.

Dipl. Civil Eng., 28, reg'd, single, 320 credits from Eur. and Am. Universities, European background. Publications on wells and blasting. 5 yrs. exp. in hydr., stress anal., surv., found., oil drilling. Pioneer job preferred. U.S. or overseas. PW-8076, Engineering News-Record.

Construction Superintendent, White, 52 years of age, 27 years supervisory experience in building construction, e.g. Public utilities, industrial, refinery, chemical plants, federal and public buildings, military installations and housing. Qualified, with recommendations and references. Midwest preferred, other locations will be considered. Available this writing. Address reply to: Wm. H. Orndorff, P.O. Box 4, Vincennes, Indiana.

Excavation Supt.—Engr.—Foreman or Drilling & Blasting Engr.—8 yrs. exp. Heavy Rock Excavation. Engrng. Background Stripping or Quarry preferred. United States or Overseas. PW-8092, Engineering News-Record.

Ass't. Supt. Heavy Const.—32, 10 yrs. diversified engineering and field experience on highways and bridges. Presently Ass't. Project Engineer on finals of $5-Million Air-Force facility. Desires position with future with private firm. PW-8094, Engineering News-Record.

Position Desired—Spent 33 years in the sale of equipment, age 55, 100% active and aggressive, free to travel or locate any place, prefer factory affiliation or would consider good distributor proposition, entire career spent mutually profitable with only two organizations, service available after June 15, 1958. PW-8087, Engineering News-Record.

P.E., BCE, 38, exp'd. all phases conc. work incl. fdns, superst, finish. Estimate, field supv., dtl. reinf. formwork, sales, design. PW-8088, Engineering News-Record.

Construction Engineer, BSCE, 34, 1 year structural design, 6 years field engineering & contract management in industrial construction. PW-8083, Engineering News-Record.

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Graduate Civil Engineer with Five years experience in Surveying, Construction Supervision and Design desires affiliation with established surveying and engineering firm or contact with engineer or surveyor desiring to form such a firm. PW-8073, Engineering News-Record.

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After every major flood, property damage in the millions of dollars is reported. And in the majority of cases the toll could have been cut in half if the flood-waters had had a reasonably unobstructed channel in which to flow at less than destructive velocities. The necessity for flood plain zoning long has been recognized.

After the 1955 flood, which caused $320 million damage, Connecticut decided it had had enough. It passed a law with teeth in it, gave a state agency—the Water Resources Commission—police powers backed by the courts, and set about devising the engineering criteria by which the boundaries of the unobstructed flood plain would be set. There are 75 miles of riverbank in Connecticut now zoned against new buildings (and made undesirable for existing ones), and in two years another 75 miles will be zoned. How Connecticut is carrying out this remarkable program was described in an article in the May 22 issue, p. 46. It should be read by everyone who has thought flood plain zoning was impossible.

What Price Prestige?

AS SOME OF THE BIGGEST and best contractors in the country bid their way to jobs on the St. Lawrence Seaway and Power Project four and five years ago, it was apparent that this was the big one they had been waiting for. Competition was keen, and the early prices that came in must have looked pretty good to the Power Authority of the State of New York and to the Corps of Engineers, design-construction agent for the St. Lawrence Seaway Development Corp.

No fools rushed in; the names read mostly as from a blue-book of contractors. Dravo, Wikestrom, Walsh, Perini, Morrison-Knudsen, Kiewit, Utah, Great Lakes, Mt. Vernon, Arthur Johnson, Al Johnson, and Winkleman were in the lineup on the Power Authority work. Many of the same names showed up on the major canal excavation work and on lock construction for the Seaway. Only lock excavation went to contractors who might have been considered then as outside the big league.

The "big league" contractors who got St. Lawrence work wanted it very badly. In the case of the power dam, it should be recalled, PASNY (as well as its Canadian counterpart, Ontario-Hydro) was able to resort to a highly irregular procedure, choosing other than the low bidder and then negotiating with him for new unit prices to bring his contract amount down to below the low bid. No excuse was offered at the time (ENR July 7, 1955, p. 96) either for this flaunting of the bidding system by the owners or for the submission to bid shopping by the contractors.

It was obvious soon after the St. Lawrence work got under way that many a contractor was bleeding, his wounds self-inflicted with an overly sharp pencil. Dravo got in early, did a difficult job, and got out—bidding for no more of the St. Lawrence "prize." The sardonic among contractor forces amused themselves with the humor of the situation: So many contractors "buying" prestige so dearly. And ironic it was that none of the big-name firms involved had serious need for prestige—certainly not at its then going price.

Now, the price of prestige as peddled by PASNY on the shores of picturesque Long Sault, can be estimated, in a way. As reported May 15 (p. 26), seven major contractors had claims totaling $27.6 million, and they settled with the Power Authority for $4.9 million. This could be figured to mean that, on the average, these seven contractors brought some $3 million worth of prestige in doing their power project jobs on the St. Lawrence. While we have naught but admiration for the way the work was prosecuted by these capable contractors, we must admire all the more the great success PASNY has registered in keeping the cost of its $335 million project within available borrowed funds. Prestige has been bought dearly here; we hope those who have paid the price feel they got their money's worth.

It's Not All Science

THE NEXT TWO WEEKS will be graduation time in the nation's engineering colleges and also the time for commencement addresses. Appropriate subjects for such addresses are never too plentiful, but one which seems particularly suitable is suggested by the article on pier fenders, which was published in the May 8 issue, p. 40.

It seems that for pier fender design no hard and fast rules are possible; the unconventional approach based on ingeunity and common sense is normal practice. In other words, good engineering is art as well as science. This is a message always worth impressing on young engineering minds—and perhaps on some not so young. For it can sometimes happen that an engineer has been taught so well the ordinary ways of tackling a problem that common sense and ingenuity are overlooked when something unusual is encountered. Convention and standardization then become indispensible crutches.

The most successful engineer will be the one who is a master of his science, while never being a slave to standards and conventions. And he will use art to supplement his science by developing a sensitive feel for his work, which will show up in imaginative creation and novel invention. The improvisations and ingenious engineering used by the pier fender designers provide striking evidence of such an artful touch.

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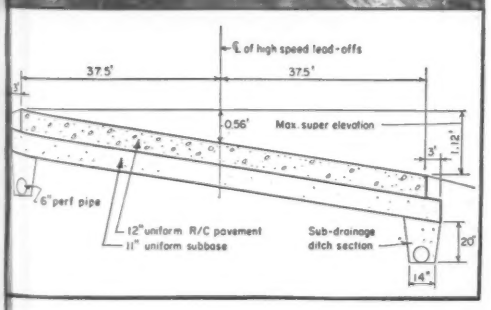
Drawing: cross section through high-speed turn-off.



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a

Soil stabilization with Texaco Cutback Asphalt

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Photos

a. Applying a medium-curing Texaco Cutback Asphalt to windrow of soil.

b. Pulvi-mixer and motor grader blend Cutback Asphalt and soil.

c. Compacting Texaco-treated soil with multi-wheel and tandem rollers.

d. Completed soil stabilization project in Wadena County, Minn.

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Wadena County, Minn., is building this road by stages, thus spreading the cost over a period of years. Pictured here is the first stage. The cohesionless soil on the road is being stabilized by a thorough blending with a Texaco Medium-curing Cutback Asphalt. This transforms the formerly dusty, muddy road into a durable, waterproof, all-weather surface.

Eventually, when the increased volume and weight of traffic require it, the Texaco-stabilized surface will become the foundation for a heavy-duty, hot-mix asphaltic concrete wearing surface, two to three inches thick.

The new surface will form a close, lasting bond with the previously stabilized base. The result is a flexible, rugged pavement, which absorbs heavy impact year after year with a minimum of maintenance.

Whether you are building or improving a road, street, airport or parking area, there is a type of Texaco asphalt construction exactly suited to your requirements. These types range from heavy-duty paving for interstate highways down to an inexpensive surface-treatment to eliminate dust and mud. Helpful information on all of these asphalt types is supplied in two free booklets. Copies can be obtained without obligation by writing our nearest office.

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